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John Wesley Powell Student Research  
Conference

2005, 16th Annual JWP Conference

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Apr 16th, 8:00 AM - 8:30 AM

# Complete 2005 Program

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CENTER FOR  
NATURAL SCIENCES  
**SATURDAY**  
**APRIL 16, 2005**

<http://www.iwu.edu/jwprc>



**Illinois Wesleyan**  
UNIVERSITY

*The conference is named for explorer and geologist John Wesley Powell, a one-armed Civil War veteran and a founder of the National Geographic Society who joined Illinois Wesleyan University's faculty in 1865. He was the first U.S. professor to use field work to teach science. In 1867 Powell took Illinois Wesleyan students to Colorado's mountains, the first expedition of its kind in the history of American higher education. Later, Powell was the first director of the Smithsonian Institution's Bureau of Ethnology.*

Sixteenth Annual  
John Wesley Powell • IWU

# Student Research Conference

Science Commons  
Center for Natural Sciences  
Saturday, April 16, 2005  
8:30 a.m. – 6:00 p.m.

*Official Program*

## **ACKNOWLEDGEMENTS**

The John Wesley Powell Research Conference Committee would like to acknowledge the contributions of several individuals.

This conference could not have been a success without the contributions of Pat Neustel in organizing many aspects of the conference and assembling and printing the program booklet.

The invaluable assistance provided by Mike Welsh and his staff at Sodexho Campus Services in setting up breakfast, luncheon and other refreshments is gratefully acknowledged.

The assistance provided by Patrick McLane and Curtis Kelch of Information Technology in setting up computer equipment in all rooms and constructing and updating the conference website is greatly appreciated.

John Wesley Powell Research Conference Committee:

- Sara Freeman (Theatre Arts)
- Linda French (Physics)
- Mike Seeborg (Economics)
- Mike Theune (English)

## **SCHEDULE OF EVENTS**

**Saturday, April 16, 2005**

|            |  |                              |
|------------|--|------------------------------|
| 8:30 a.m.  | Continental Breakfast and Poster Setup     | Science Commons              |
| 9:00 a.m.  | Poster Session A                           | Science Commons              |
| 10:00 a.m. | Keynote Address: Dr. James Gentile         | Anderson Auditorium (C101)   |
| 11:00 a.m. | Oral Presentations – Session I             |                              |
|            | Session 1                                  | CNS E101                     |
|            | Session 2                                  | CNS E102                     |
|            | Session 3                                  | CNS E103                     |
|            | Session 4                                  | CNS E104                     |
| 12:15 p.m. | Luncheon                                   | Main Lounge                  |
| 1:15 p.m.  | Poster Session B                           | Science Commons              |
| 2:35 p.m.  | Oral Presentations – Session II            |                              |
|            | Session 5                                  | CNS E101                     |
|            | Session 6                                  | CNS E102                     |
|            | Session 7                                  | CNS E103                     |
| 4:00 p.m.  | Senior Art Show and Critique               | Merwin and Wakeley Galleries |
| 5:15 p.m.  | Performances of Music Student Compositions | Westbrook Auditorium         |

**KEYNOTE SPEAKER**

**"CARCINOGENS IN THE ENVIRONMENT: SEPARATING FACT FROM FICTION"**

Dr. James M. Gentile, President of Research Corporation

10:00 a.m. Anderson Auditorium (C101)

Dr. James Gentile is the recently-appointed president of Research Corporation, one of the nation's leading private foundations for the development of scientific research at colleges and universities. Dr. Gentile is an internationally-recognized scientist in the area of chemical mutagenesis and DNA damage processing. Among his many research projects, Dr. Gentile has studied how certain chemicals, such as pollutants and agrochemicals, can react with plants in ways that are harmful to the humans who might later eat them. Prior to his appointment, Dr. Gentile served as the Dean for the Natural Sciences and the Kenneth G. Herrick Professor of Biology at Hope College, in Holland, Michigan. Dr. Gentile has served as a panelist, consultant, advisor or board member for a wide variety of scientific, educational and government organizations, including the U.S. Environmental Protection Agency's Advisory Board and the World Health Organization Advisory Group. Dr. Gentile received his bachelor's degree in biology/chemistry from St. Mary's University (Winona, MN), and his M.S. and Ph.D. degrees from Illinois State University in 1970 and 1974. In 1976, he completed a postdoctoral fellowship in the Department of Human Genetics at Yale University's School of Medicine. He has authored and co-authored 160 scientific publications and serves as the Editor-in-Chief of Mutation Research. Dr. Gentile has received numerous honors and awards, including the Environmental Mutagen Society's Alexander Hollaender Award, which recognizes research excellence and outstanding contributions in educating students, and he has been named a Fellow in the American Association for the Advancement of Science.

# **STUDENT PARTICIPANTS**

## **Oral and Poster Presentations**

|                       |      |                     |           |
|-----------------------|------|---------------------|-----------|
| David H. Aggen        | P1   | Bridget Haddad-Null | P29       |
| Peter W. Anzalone     | P3   | Charles Haugland    | P61       |
| Trefan Archibald      | P2   | Amber S. Hays       | O3.2      |
| Aaron D. Bailey       | P9   | Matthew Hendrickson | P30       |
| Krystle Balhan        | P5   | Elizabeth Holman    | P31       |
| Ashvin R. Baru        | P6   | Adam Houser         | P33       |
| Maura K. Bates        | P8   | Jena Hudson         | P32       |
| Eric D. Bell          | P7   | Diana P. Jirschele  | P15       |
| Sarah Bennett         | P11  | Robin D. Johnson    | P8        |
| Xun Bian              | O6.1 | Jonathan Kaplan     | P23       |
| Erin Boente           | P10  | Olukayode Karunwi   | P34       |
| Stephanie M. Brewer   | P4   | Danielle Kuczera    | O4.1      |
| Tina Brionez          | P12  | Joshua R. Lacey     | P36       |
| Scott Brombosz        | P13  | John Larson         | O1.2      |
| Mitchell Brookins     | P14  | Kelly Lingen        | P35       |
| Amy Buenning          | O1.1 | Ashley Locke        | O7.3      |
| Jordan Burton         | P15  | Jessica Lothman     | O5.3, P37 |
| Austin Buscher        | O4.3 | Lauren Macey        | P38       |
| Phillip Butler        | P16  | Becca Marsh         | P39       |
| Chris Butts           | O2.2 | Michael McAvoy      | P40       |
| Alicia Carney         | P57  | Katherine McCulloch | P41       |
| Qiana Cryer           | P17  | Hannah Meharry      | P22       |
| Alison Daigle         | P18  | Sean Moran          | P42       |
| Jodie Daquilanea      | O5.2 | Laura Myford        | O5.1      |
| Elizabeth de Martelly | O6.3 | Gautham Narayan     | O2.3      |
| Jason Dulac           | P19  | Briana North        | P63       |
| Christopher M. Duncan | P20  | Shannon O'Rourke    | P43       |
| Taylor Entwistle      | P59  | Debo Olaosebikan    | O2.2      |
| Kelly Feder           | P21  | Ann C. Palma        | P44       |
| Patrick Fischer       | P22  | Ellen Perry         | P25       |
| Dan Flaughner         | P23  | Jennifer Peterson   | O7.2      |
| Erin N. Fleck         | P8   | Doug Pietrzak       | O7.4      |
| Jennifer Freeman      | P24  | Elizabeth Planas    | P46       |
| Kathleen Garibaldi    | P25  | Bill Porter         | O4.1      |
| Adrien Gatesman       | P26  | Mark Portolese      | O2.1      |
| Ariana Giles          | O7.1 | Megan Presnak       | O1.3      |
| Angela Glasker        | P27  | Stephanie Reynolds  | P17       |
| Myla Green            | P28  | Keelia Rhoads       | P45       |

Continued....

**STUDENT PARTICIPANTS**  
**Oral and Poster Presentations**

|                     |      |
|---------------------|------|
| Ana Maria Romero    | O6.2 |
| Jennifer Roney      | O5.4 |
| Mark N. Rubin       | P47  |
| Eric Sala           | P48  |
| Patricia Setchell   | P49  |
| Lindsay Sicks       | P8   |
| Jenna Simpson       | O4.2 |
| Ryan N. Smith       | O6.4 |
| Ryan Smith          | P50  |
| Nathan Smoter       | P51  |
| Katrina Tammen      | P52  |
| Andrew Tarman       | P53  |
| Darcy Thompson      | P54  |
| Michelle Uhlenkott  | P55  |
| Jennifer VanderZee  | O3.3 |
| Elizabeth Whitehill | O3.1 |
| Lavanga Wijekoon    | P56  |



**BFA SENIOR CRITIQUE HONORS  
SCHOOL OF ART  
Saturday, April 16, 2005, 4:00 p.m., Merwin and Wakeley Galleries**

Student Presenters:

Kristy Scher

Jill Eberspacher

Laura Hohn

Shannon Hosmer

*Refreshments will be served*

**MUSIC COMPOSITION STUDENT PRESENTATIONS**  
**Saturday, April 16, 5:15 p.m., Westbrook Auditorium**

**Paper Due Today**

**Daniel Vendt '05**

Film with original soundtrack

**Unsatisfyingly Short Pieces for Piano**

**Rachel Marx '05**

Searching for Christmas Gifts

Jean-Claude

80 Degrees

Elusion

La Dee Dah

Tara Gebbink, piano

**3/2**

**Heather Straley '06**

Illinois Wesleyan University Percussion Ensemble

Amanda Legner, Director

Music Presentation

**WESLEYAN PERSPECTIVES**

Daniel Vendt and David Vayo\*  
School of Music, Illinois Wesleyan University

"Wesleyan Perspectives" is a series of short films that combine music, photography, and videography. The piece explores the relationship between film and music in different settings. The visual subjects are a reflection of the life of a student at Wesleyan, and the music is meant to help convey the different feelings of the composer on each subject.

Music Presentation

UNSATISFYINGLY SHORT PIECES FOR PIANO

Rachel Marx and David Vayo\*  
School of Music, Illinois Wesleyan University

This is an ever-growing collection of “rainy day” pieces. I enjoy writing miniatures for the piano, especially when I am working on a large composition project and need the adrenaline rush created by finishing a composition. "Searching for Christmas Gifts" was the first to be written and is programmatic, creating the image of a young child sneaking around to find where his parents have hidden his Christmas presents. As soon as he finds them, he must sneak away before being caught. "Jean-Claude" is named for my African dwarf frog that, sadly, is no longer living. However, when I wrote this piece, he was a very active and amusing aquatic frog! "80" was so named because it sounds just a little “off”. If it was straightforward, it might instead be called "90". The longest piece in this collection so far is "Elusion", written last fall. I had difficulty trying to pinpoint the best way to describe the piece and could not find any acceptable words for it. (Thus the name "Elusion".) "La Dee Dah" was written just in time for my senior recital in January. It has a light-hearted nature similar to those of "Searching for Christmas Gifts" and "Jean-Claude" but with a jazz influence. I intend to keep adding pieces to this collection and hope to eventually have several volumes of Unsatisfyingly Short Pieces for Piano.

Music Presentation

3.2

Heather Straley and David Vayo\*  
School of Music, Illinois Wesleyan University

3:2 is a composition written for six percussionists and a pianist. The body of the piece is comprised of triple metered measures however each measure, usually in alternation, is subdivided differently. One division is three plus three equaling two big beats, the alternating measure being divided into two plus two plus two equaling three big beats. The title, a ratio which could be flipped to read 2:3, reflects the alternation of the subdivided meter.

**ORAL PRESENTATIONS - SESSION 1**

**11:00 – 12:00**

**CENTER FOR NATURAL SCIENCES (E101)**

**CHAIR: ADRIENNE INGRUM**

- 1.1 Amy Buenning  
Political Science
- 1.2 John Larson  
Political Science
- 1.3 Megan Presnak  
Political Science
- 1.4 Danielle Kuczera  
International Studies

**ORAL PRESENTATIONS - SESSION 2**

**11:00 – 12:00**

**CENTER FOR NATURAL SCIENCES (E102)**

**CHAIR: ANA MARIA ROMERO**

- 2.1 Mark Portolese  
Computer Science
- 2.2 Chris Butts and Debo Olaosebikan  
Physics
- 2.3 Gautham Narayan  
Physics

**ORAL PRESENTATIONS - SESSION 3**

**11:00 – 12:00**

**CENTER FOR NATURAL SCIENCES (E103)**

**CHAIR: ADRIAN GATESMAN**

- 3.1 Elizabeth Whitehill  
Biology
- 3.2 Amber Hays  
Psychology
- 3.3 Jennifer VanderZee  
Psychology

**ORAL PRESENTATIONS - SESSION 4**

**11:00 – 12:00**

**CENTER FOR NATURAL SCIENCES E104**

**CHAIR: MOLLY MCLAY**

- 4.1 Bill Porter  
Philosophy
- 4.2 Jenna Simpson  
History
- 4.3 Austin Buscher  
Religion

**ORAL PRESENTATIONS - SESSION 5**

**2:35 – 3:50**

**CENTER FOR NATURAL SCIENCES (E101)**

**CHAIR: ELIZABETH PLANAS**

- 5.1 Laura Myford  
Anthropology
- 5.2 Jodie Daquilanea  
Sociology
- 5.3 Jessica Lothman  
Sociology
- 5.4 Jennifer Roney  
Women's Studies

**ORAL PRESENTATIONS - SESSION 6**

**2:35 – 3:50**

**CENTER FOR NATURAL SCIENCES (E102)**

**CHAIR: ADAM GRAY**

- 6.1 Xun Bian  
Economics
- 6.2 Ana Maria Romero  
Economics
- 6.3 Elizabeth de Martelly  
Environmental Studies
- 6.4 Ryan Smith  
Environmental Studies

**ORAL PRESENTATIONS - SESSION 7**  
**2:35 – 3:50**  
**CENTER FOR NATURAL SCIENCES E103**  
**CHAIR: RACHEL SLOUGH**

- 7.1     Ariana Giles  
         French
- 7.2     Jennifer Peterson  
         Hispanic Studies
- 7.3     Ashley Locke  
         English
- 7.4     Doug Pietrzak  
         English/Educational Studies

Note: Student's name is underlined, faculty advisor designated with \*

Presentations are 10-15 minutes in length. If time permits, there will be a question-and-answer period for all presenters following the final presentation.



Oral Presentation O1.1

**WHY THEY HATE US: AN EMPIRICAL STUDY OF INDIVIDUALS'  
ANTI-AMERICAN ATTITUDES**

Amy Buenning and Frank Boyd\*  
Political Science Department, Illinois Wesleyan University

After September 11, 2001 Americans became keenly aware of a growing trend in anti-Americanism throughout the world. According to the Pew Charitable Trust, favorability rates towards the United States have fallen in 19 of the 27 tracked countries since 2000. These attitudes have attracted the attention of the mass media, but there has been little systematic analysis of this phenomenon. This paper examines global demographic and attitudinal information taken from the Pew Global Attitudes survey, an attempt to access the worldview of over 38,000 individuals in 44 nations. Interestingly, a cross-national comparison of citizen's attitudes and demographics yield weak but statistically significant correlations that indicate the potential causes of anti-American attitudes. While this paper does not definitively answer the question, "why do they hate us," it does provide a window into studying anti-American attitudes from a social science perspective.

Oral Presentation O1.2

**BREAKING THROUGH THE MONOPOLY**

John Larson and Tari Renner\*

Political Science Department, Illinois Wesleyan University

In contemporary American politics, it is a commonly accepted fact that African American voters are overwhelmingly supportive of the Democratic Party. However, given the articulated desire of Republicans to break through this electoral monopoly, one should consider how long this loyalty to the Democratic Party will last. The purpose of this paper is to examine if and how the Republican Party can successfully court African American voters from the Democratic Party. This study employs a qualitative research design involving a case study of four different Republican members of Congress who were relatively successful in attracting African American voters. The findings of this research indicate that one of the most successful factors in Republican candidates gaining African American voters was descriptive representation. This study suggests that the Republican Party's prospect of gaining African American voters should not be dismissed and encourages further scholarly attention to this important question.

Oral Presentation O1.3

**CENTRAL BANK INDEPENDENCE IN SUB-SAHARAN AFRICA:  
AN ANALYSIS, 1960-1989**

Megan Presnak and Frank Boyd\*

Political Science Department, Illinois Wesleyan University

Central banks are instrumental to shaping and implementing monetary policy in both industrialized and developing countries. They affect exchange rates, interest rates, and the success of private banks within their home country. A vast amount of research has been devoted to looking at the autonomy of central banks in developed countries and factors that affect their autonomy. Research suggests that a high level of informal central bank independence, as opposed to legal, or formal, central bank independence is a precondition for macroeconomic stability in developing countries. This study aims to examine the behavior of central banks in sub-Saharan Africa.

The evidence presented in this article suggests that the legal autonomy of a central bank in sub-Saharan Africa cannot solely account for its policymaking capacity. On the other hand, the measure of informal independence, central bank governor turnover, appears to have little explanatory power, with respect to bank capacity either. This research implies that further research must employ alternative measures of central bank independence in order to explain fluctuations in exchange rates. Central bank independence in sub-Saharan African countries is driven mainly by the political climate, as opposed to the economic climate.

Oral Presentation O1.4

**A LEARNING PROCESS: THE IMPLEMENTATION AND EFFECTS OF  
RETURNEE POLICIES IN POST-WAR BOSNIA-HERCEGOVINA**

Danielle Kuczera and Kathleen Montgomery\*  
International Studies Program, Illinois Wesleyan University

There are nearly 17.1 million refugees, internally displaced persons, and asylum seekers in the world today. Eighty percent are women and children. Two million of those refugees and IDPs originated from Bosnia-Herzegovina in 1995. According to the United Nations High Commissioner of Refugees report, Bosnia reached 1 million returnees this March. The Dayton Peace Accords, signed in 1995, provided the legal framework for returning refugees and internally displaced persons to their homes of origin, outlining the actors in this process - specifically the UNHCR, but also other international organizations, non-governmental organizations, the international community, and the Bosnia-Herzegovina government. Beyond this outline, there was no clear implementation plan. Analyzing the process, the mistakes, and the triumphs Bosnia-Herzegovina faced through the return process, and using BiH as a case-study, other countries can overcome the obstacles. (The lessons learned in Bosnia-Herzegovina have already helped the return process in Kosovo and Former Yugoslav Republic of Macedonia.) The world continues to face refugee, internal displacement, and returnee issues due to civil, political, and economic strife. The international community, local governments, and international and local NGOs are trying to assist in these situations, hoping to alleviate the problems. Looking over my interviews and evaluating the situation from my understanding, I have found the greatest challenge these actors face is a lack of communication.

Oral Presentation O2.1

**USING BINARY SPACE SUBDIVISION TO OPTIMIZE PRIMARY RAY  
GENERATION IN RAY-TRACING**

Mark Portolese and Weiyu Zhu\*

Computer Science Department, Illinois Wesleyan University

Ray-tracing algorithms have the potential to create extremely realistic three-dimensional computer graphics. The basic idea is to trace light rays from the user through the computer screen into the hypothetical three-dimensional world. This is done to determine what objects should be displayed on the screen. Furthermore, these rays are traced back to the light sources themselves to determine shading and other photorealistic effects. However, without optimization these algorithms are slow and impractical. This paper explores the use of the classic binary space subdivision algorithm in order to speed up the process. Binary space subdivision is the use of binary trees to recursively partition the screen into rectangular areas which are then rendered separately. The algorithms were implemented using C++. The use of binary space subdivision usually produced a frame rate double that of the unoptimized implementation.

Presentation O2.2

**SIMPLE AND ACCURATE EXPERIMENTAL METHOD FOR  
MEASURING FARADAY ROTATION**

Chris Butts, Debo Olaosebikan, and William D. Brandon\*  
Physics Department, Illinois Wesleyan University

High fidelity measurements of the magneto-optic phenomenon, Faraday rotation, have proven challenging in undergraduate laboratories. In this study, an extremely accurate experimental method of measurement, implementing an apparatus principally constructed of equipment accessible in a typical undergraduate laboratory, is described. In particular, the dispersion of the Verdet constant of water was measured at wavelengths ranging from 473 nm to 890 nm and found to agree with accepted literature values. The method addresses issues involving light detection in the context of polarization spectroscopy, implements digital signal processing for the purposes of data acquisition, and demonstrates the advantages of phase sensitive detection.

Oral Presentation O2.3

**PHOTOMETRY OF OUTER-BELT OBJECTS**

Gautham Narayan and Linda French\*  
Physics Department, Illinois Wesleyan University

We present results from multi-wavelength observations of outer-belt Asteroids 2067 Aksnes, 15231 Ehdita, 279 Thule and Comet C/2002 CE<sub>10</sub> (LINEAR). Formerly classified as Asteroid 2002 CE<sub>10</sub>, the last object's orbital elements lead to its classification as a member of a group of asteroids called the Damocloids. The Damocloids' orbits are similar to Halley family comets (HFCs), and there is suspicion that the Damocloids are inactive HFC nuclei. Following observations by the Japanese Subaru telescope in August 2003, which determined that 2002 CE<sub>10</sub> had a characteristic tail (Takato et al, 2003, IAU Circular 8193), it was re-classified as a comet.

We observed the objects with Kron-Cousins BVRI filters corresponding to the blue, visible, red, and near-IR wavelengths using the 0.9-m SMARTS telescope at the Cerro Tololo Inter-American Observatory during October 2003. Using the image reduction routines (IMRED) of the Image Reduction and Analysis Facility (NOAO X11/IRAF), we removed the bias caused by dark currents, and flat fielded the data to improve the SNR. Instrumental magnitudes for all objects were extracted using the aperture photometry package (APPHOT). Landolt standard stars were used to solve the transformation equations and extract extinction coefficients. Photometric calibration routines (PHOTCAL) allow us to use the extinction coefficients and instrumental magnitudes to determine absolute magnitudes. The rotation period has been determined using the phase dispersion minimization (PDM) algorithm first developed by Stellingwerf (Stellingwerf, R.F., 1978, ApJ 224, 953-960). We place constraints on the size of the objects.

Oral Presentation O3.1

**ARE NUTRIENTS ASSIMILATED IN JUVENILES OF THE BRITTLE STAR  
AMPHIPHOLIS SQUAMATA (ECHINODERMATA: OPHIUROIDEA)?**

Elizabeth Whitehill and William Jaeckle\*  
Biology Department, Illinois Wesleyan University

Many brittle stars brood their young in bursae, internal pouches that are open to the exterior at the bases of the arms (Byrne 1991). These bursae are both a site of gas exchange and serve as an opening for gamete release. In some species, the bursae are also used for brooding (Ruppert and Barnes 1994). For species that brood, eggs are released into the bursal pouch where they are fertilized. While developing, larvae may receive nutrition from the yolk stores from the egg and from another source. The ophiuroid *Amphipholis squamata*, with its small, non-yolky eggs, is thought to follow the latter example. Its eggs are on average 100  $\mu\text{m}$  in diameter (Walker and Lesser, 1989) and the juveniles grow to have a disc diameter of about 800  $\mu\text{m}$  when they exit the bursae (Fell, 1946). An egg of this species cannot provide enough direct nutrition to produce a juvenile; the developing larvae must acquire nutrients from another source. Fontaine and Chia (1968) found that the developing larvae and juveniles of *A. squamata* assimilated dissolved organic material (DOM) as small, monomeric units of glucose and amino acids. Because these organic molecules are so low in energy, it is unlikely that their presence as DOM in seawater would contribute significantly to larval nutrition. We therefore designed this study to determine if the juveniles of *A. squamata* are able to take up DOM in the form of large polysaccharides (dextran) and polypeptides (ferritin and albumin) because these molecules are more likely to provide a substantial source of nutrients for developing larvae and juveniles.



Oral Presentation O3.2

**PARENT-TEACHER COLLABORATION WHEN STUDENTS HAVE AUTISM  
SPECTRUM DISORDERS: THE ROLE OF TEACHER TRAINING**

Amber S. Hays and Linda Kunce\*  
Psychology Department, Illinois Wesleyan University

Over twenty years of research demonstrates the importance of collaborative relationships between parents and teachers, particularly when students have autism (e.g., Ruble & Dalrymple, 2002). However, many educators remain uninformed about autism (Helps, Newsom-Davis, & Callias, 1999) and untrained in working with parents (Lazar & Slostad, 1999). The present study evaluated an intervention designed to (a) provide educators with a basic theoretical understanding of autism, (b) encourage more positive attitudes toward parent-teacher collaboration, and (c) help educators to feel more comfortable and confident in their abilities to work with parents. The study followed an experimental design, with 30 education majors randomly assigned to one of two conditions. Participants in both conditions received general information about autism, but only those in the experimental condition received additional specific training in parent-teacher collaboration. Analyses of pre- and post-intervention measures revealed that both conditions were effective in increasing (a) knowledge about autism, (b) positive attitudes toward collaboration, and (c) comfort and confidence levels in working with parents of children with autism. Moreover, the experimental condition yielded significantly higher results than the control condition, providing support for the specific training in collaboration.

Oral Presentation O3.3

**AN INVESTIGATION OF THE INFLUENCE OF HOPE ON THE  
RELATIONSHIP BETWEEN RACIAL DISCRIMINATION AND DEPRESSIVE  
SYMPTOMS AMONG AFRICAN AMERICAN COLLEGE STUDENTS**

Jennifer L. VandeZee and Kira Hudson Banks\*  
Psychology Department, Illinois Wesleyan University

The relationship between perceived racial discrimination, hope, and depressive symptoms among African American college students was investigated. The first supported hypothesis was that racial discrimination, hope, and hope's two components, agency and pathways, would each significantly affect depressive symptoms. It was also predicted that hope, pathways, and agency would each have a significant interaction effect with racial discrimination on depressive symptoms and that these interactions would explain more variance than racial discrimination, hope, agency, and pathways alone. While hope and pathways each interacted with racial discrimination to predict depressive symptoms, agency did not. Also, the interaction effect of pathways and racial discrimination on depressive symptoms explained more variance than any of the other models. These results suggest that hope and pathways moderate the relationship between racial discrimination and depressive symptoms.

Oral Presentation O4.1

**HUME, BLACKBURN, AND KORSGAARD ON THE SENSIBLE KNAVE**

Bill Porter and Charlotte Brown\*  
Philosophy Department, Illinois Wesleyan University

In "Ruling Passions," Simon Blackburn advances an ethical theory that welds Blackburn's quasi-realism to a Humean-Smithean theory of moral sentiments. This paper concerns the latter Humean side of Blackburn's theory, specifically Blackburn's treatment of Hume's famous problem of the sensible knave.

I have two tasks. My first task is to examine Hume's original formulation of, and reply to, the problem posed by the sensible knave. Also, I will deal with two complexities in Hume's picture: a prima facie circularity problem, and the threat posed by a variation or descendant of the original sensible knave.

My more ambitious second task is an examination of the knave-related contemporary controversy between Blackburn and Christine Korsgaard. Blackburn's Humean defense consists especially in his repudiation of criticism levelled against Humean theories by Korsgaard in "The Sources of Normativity." I hope to show that Blackburn fails to escape Korsgaard's argument that Humean theories generally fail, in the case of the knave, to fulfill a requirement of transparency.

Oral Presentation O4.2

**REFORMING THE STAGE AND SCREEN: DIFFERENCES IN THE FILM AND  
THEATRE CENSORSHIP MOVEMENTS IN EARLY-1930S NEW YORK**

Jenna Simpson and Robert Schultz\*  
History Department, Illinois Wesleyan University

Although Hollywood and Broadway shared a number of traits and talents in the early 1930s, the movements seeking to censor each medium were quite different in their ideologies, tactics, and outcomes. As this presentation will show, paternalistic attitudes about class and immigration, fears about the protection of children, the regional nature of theatre, the force of popular opinion, and the circumstances of the historical situation all played into the successes of each movement, while at the heart of these factors was a differing perception of the essential purposes of film and theatre. Together, these elements created a movie censorship drive that was concerted, powerful, and effective; they produced a stage censorship drive that was relatively weak and disorganized, taking a back seat to the efforts to reform the silver screen.

Oral Presentation O4.3

**THE INTERNET AND NEOPAGANISM: A MATCH MADE IN AVALON**

Austin Buscher and Carole Myscowski\*  
Religion Department, Illinois Wesleyan University

Although the Neopagan, Witchcraft, and Wiccan movements have started to gradually move from bearing the title of "cults" toward being considered legitimate new religious movements by the general public, they still face some difficulties in the areas of canonization, orthodoxy, and hierarchy. This presentation will examine some of the inherent problems in these new religious movements and will examine how these groups use the Internet as a tool to resolve some of these issues. Although research indicates that the way the Internet is used in a religious context can vary greatly and depends largely on the individual's concept of "cyber space" and their relationship with it, there are some noticeable themes in the way religion, specifically neopaganism, employs the Internet. Specifically, the Internet can be used as a ritual meeting place, a forum to discuss and share ideas, a collection of sacred texts and other pertinent information, or any combination of the above. The way in which the Internet is used as a religious medium depends on the attitude of the religion and of its practitioners; because of this, the Internet is an ideal medium for practitioners of neopaganism.

Oral Presentation O5.1

**BEYOND THE BUN: AN ETHNOGRAPHIC EXAMINATION OF MEANINGS  
AND SIGNIFICANCE OF HAIR IN SAMOA**

Laura Myford and Rebecca Gearhart\*  
Anthropology Department, Illinois Wesleyan University

This paper examines the meanings and significance of hair in Samoa, with focuses on hair length, color and texture, and style in Samoa, from both historical and contemporary perspectives. Data has been gathered from interviews, observations and surveys, and seeks to present the information in an ethnographic format. Examined in depth is the topic of the tuiga, the Samoan ceremonial headdress, with an emphasis on its changing construction and usage. Hair and tourism in Samoa is another focus, specifically how Samoans are portrayed in the literature produced to lure travelers to Samoa. Also discussed are the teine sa, or spirit women of Samoa, and how and why the threat of repercussions for going against social norms relating to hair affect Samoans today. In conclusion, the effects of increasing Westernization are discussed in terms of its effects on hair, its visible markers in Samoa in relation to hair, and its implications for the future in Samoa.

Oral Presentation O5.2

**RESPONSES TO ETHICAL ISSUES OF LATE MODERNITY**

Jodie Daquilanea and Christopher Prendergast\*  
Sociology Department, Illinois Wesleyan University

This paper explores the ethical principles and conceptualizations articulated by members of the Theosophical Society in America. The research focuses on the Theosophical Society's responses to ethical issues of late modernity, specifically to Zygmunt Bauman's problems of universality and foundation. In their responses to issues of late modernity, members of the Theosophical Society employ premodern, modern, and postmodern approaches in their conceptualizations of morality in a unique Theosophical framework. Special attention was paid to the members' use of postmodern ethics.

The data analyzed consists of one- to two- hour long qualitative interviews conducted with individual members of Theosophical Society, as well as documents issued by the Theosophical Publishing House that address ethical issues. The members were asked to explore their own conceptions of morality, specifically with regard to issues of universality and foundation and to the ways that the Theosophical Society deals with problems of ethics.

Members of contemporary society grapple with the problems of universality and foundation in late modernity, and this study of the Theosophical Society illustrates some unique world-constructing methods by which to deal with these problems. There have been few studies on the Theosophical Society, and this paper brings many of their viewpoints to light.

Oral Presentation O5.3

**SOPHOMORE PERSPECTIVES: IS IWU MEETING THEIR EXPECTATIONS?**

Jessica Lothman and Teodora Amoloza\*  
Sociology Department, Illinois Wesleyan University

Illinois Wesleyan University is a private liberal arts institution that fosters a small community atmosphere. This includes the expectation that students are recognized by name and not just by an identification number. Conversations with various Student Affairs staff led to the realization that during the sophomore year there is diminishing contact with fellow students and with the student affairs and academic affairs personnel. Student Affairs personnel are concerned that this change from their First Year Experience could result in sophomore attrition. Because IWU takes pride in its ability to serve students as individuals, there remains a concern about the number of people that leave IWU as sophomores.

This study investigates the sophomore perspective about IWU. Data were collected from three different sources: student surveys, comments obtained during a class dinner, and exiting students' comments to a questionnaire. Information from these various sources helped to identify the expectations of sophomores and the extent to which these expectations were met. Analyzing these information would help to gain insight into why sophomores are not remaining at IWU for their junior year. Initial results show that IWU's resources meet the expectations of sophomores, but the university needs to address two critical areas: academic environment and student security.



Oral Presentation O5.4

**HIGH ACADEMIC-ACHIEVING COLLEGE-AGED WOMEN AND THE RISKS  
AND CHALLENGES THEY FACE**

Jennifer Roney and Vicki Magee\*

Women's Studies Program, Illinois Wesleyan University

The purpose of our proposed study is to more fully understand the social and psychological challenges and risks that high achieving female students face during college. Few studies have explored the individual experience of these high achieving women, the interplay between gender and high achievement, and the way in which high achieving women relate to their intellect. Our proposed study will contribute needed information to help fill this gap. Additionally, this study will provide information specific to IWU female students about how the university might help support their social and/or psychological development.

Oral Presentation O6.1

**PREDICTING OLYMPIC MEDAL COUNTS: THE EFFECTS  
OF ECONOMIC DEVELOPMENT ON OLYMPIC PERFORMANCE**

Xun Bian and Robert Leekley\*  
Economics Department, Illinois Wesleyan University

This paper investigates the relationship between a country's Olympic performance and its overall economic condition, including population, economic resources, and political structures. A panel data set comprises yearly data of 1996, 2000, and 2004 are estimated by using a fixed-effect Tobit regression model. Following previous studies on this topic, population size and economic resource are measured by using population and per capita GDP. One major focus of this research is the influence of political structure on national Olympic performance. Instead of using a socialist and non-socialist dummy variable like most previous studies, I used continuous variables, political freedom (PF) and civil liberty (CL), to estimate the impact of political structure.

Consistent with previous studies on this topic, the regression results indicate that countries with larger population and more abundant economic resources are more likely to perform better in the Olympic arena. Countries that are politically "Not Free" consistently perform better in Olympics by winning more medals than the rest of the world. One interesting finding of this research is the regression results, though somewhat vaguely, suggest that political freedom variables, both political freedom and civil liberty, display a U-shaped relationship with respect to medal shares. Being "Partly Free" has a negative effect on national Olympic performance as compare to countries that are "Free" and "Not Free".

Oral Presentation O6.2

**COMPARATIVE STUDY: FACTORS THAT AFFECT FOREIGN CURRENCY  
RESERVES IN CHINA AND INDIA**

Ana Maria Romero and Diego Mendez-Carbajo\*  
Economics Department, Illinois Wesleyan University

Foreign currency reserves in Asia are at an all-time high since the Asian crisis in 1997, despite experts' predictions that increased capital mobility and funds from financial institutions like the International Monetary Fund would decrease the need for foreign reserves. It is speculated that this hoarding of reserves is a by-product of a country's exchange rate regime. To test whether the exchange rate regime significantly affects a country's level of reserve holdings, China and India were selected as comparison countries in this study. China and India rank second and fifth in world reserve holding, respectively, and have reserve holdings that have been growing exponentially. They also have different types of exchange rate regimes; China has a fixed exchange rate while India has moved towards a more flexible managed float regime. However, both countries have been experiencing rapid growth due to the somewhat recent openings of their economy, making a comparison between the two viable.

According to Aizenmann and Marion (2002) two variables have been consistently found to affect reserves: exchange rate variability and economic openness. This paper tests if these variables affect reserves in China and India. Exchange rate variability refers to the variability in the exchange rate, computed from daily nominal exchange rate data. The variable was used with a lag, and it is expected to have a positive effect, since the theory is that increased volatility yesterday would encourage more reserves today. Economic openness is a variable calculated as real imports over real GDP. The theory behind this variable is that the more open an economy is, the more vulnerable it is to external financial shocks, leading a country to hoard more reserves to protect itself. Preliminary results suggest these variables are strong predictors for Indian reserve holdings, but not for China.

Oral Presentation O6.3

**CLIMATE OF CHANGE: RUSSIAN POLITICAL AND ECONOMIC FACTORS  
AND THEIR IMPACTS ON THE KYOTO PROTOCOL DECISION**

Elizabeth de Martelly and Abigail Jahiel\*  
Environmental Studies Program, Illinois Wesleyan University

President Vladimir Putin of Russia has historically been labeled as particularly unconcerned with environmental issues. But with his recent decision to ratify the Kyoto Protocol, a treaty formed in 1997 by the United Nations to curb harmful greenhouse emissions, it seems that President Putin is taking a step in the opposite direction. Through close analysis of the political apparatus of both the former Soviet Union and the current Russian Federation as well as the economic incentives involved, it becomes clear that Putin's decision was primarily motivated by substantial economic interests rather than environmental concern. The presentation will closely detail how the European Union and its invitation for Russia to join the World Trade Organization affected the economics of Putin's decision to ratify the Kyoto Protocol.

Oral Presentation O6.4

**QUENCHING CHINA'S THIRST: THE POLITICS OF WATER SHORTAGE**

Ryan N. Smith and Abigail Jahiel\*

Environmental Studies Program, Illinois Wesleyan University

China currently boasts the lion's share of the world's population, growing from about 550 million people in 1949 to roughly 1.3 billion today. According to the Pacific Institute for Studies in Development, Environment and Security, each person requires 50 liters of water per day for consumption and sanitation alone. If each person in China consumed the absolute minimum, that would amount to 62.5 billion liters of freshwater being used every day. China, and the rest of the world, for that matter, will very soon need to come to grips with a frightening reality: Due to a number of unfortunate circumstances, China simply will not have 62.5 billion liters to spare each day. Although a contributor, poor consumption habits on the part of the people are only one reason for the shortage. The problem stems largely from the very uneven rainfall distribution from which China suffers, and its horrific pollution troubles also compound the shortage. Generally speaking, the governmental policy regarding the environment on the whole is poor, which has created a number of corollary problems with relation to water. China's environmental protection apparatus is alarmingly bureaucratic, and recent steps that have been taken seem simply to be grandiose token projects that fail to address long-term issues, choosing instead to focus primarily on economic growth. The population is not expected to begin stabilizing before adding another 250 million people in the middle of the twentieth century; if Chinese environmental policy doesn't change, the water crisis promises to deliver consequences of catastrophic proportions.

Oral Presentation O7.1

**BETWEEN BEING AND BECOMING: THE SEARCH FOR IDENTITY IN  
THREE MAGHREBIAN NOVELS**

Ariana Giles and Valerie Orlando\*  
French Department, Illinois Wesleyan University

What is culture? What is identity? These are the questions that Francophone Maghrebian (Morocco, Algeria, Tunisia) authors like Leola Houari, Yamina Benguigui, and Albert Memmi ask. Whoever has spent a substantial time abroad understands the feeling of loss that one often feels for their homeland. Even if one can return, the feeling of loss continues, but this time for the foreign country. This feeling of loss is even stronger because a return is often no more than a dream. For the children of immigrants, the situation is even worse because they grow up in the liminal space between two cultures, two languages, and two identities, without ever fitting into one, unique space. When one is uprooted, one often experiences an identity crisis, produced from the confusion of not knowing where one's identity allegiances lie. In Francophone literature, a principal theme is the search for identity in the ambiguous space between two "lost" cultures. This work will explore the interstitial dynamic, socio-cultural and linguistic identity space of the Francophone author of the Maghreb.

Oral Presentation O7.2

**TOUGH LIKE MANDELA: CUBAN HIP-HOP'S STRUGGLE  
TO KEEP IT REAL**

Jennifer Peterson and Cesar Valverde\*  
Hispanic Studies Department, Illinois Wesleyan University

In this study, I explore the history and development of Cuban rap leading up to its present social, political, and artistic situation in the hopes of illustrating the divergence of the movement into two groups: commercial and underground. While the groups share a history and have qualities that overlap in several instances, a marked division exists between those who seek opportunity for financial freedom, and those who reject the world of commerce in favor of a more pure art of protest. The two branches coexist with different goals, problems, and ideologies while still forming part of a movement that reflects the current social and economic circumstances of the country and a fervent, if complex, loyalty to Cuba.

Oral Presentation O7.3

**BETWIXT-AND-BETWEEN: THE IRONIC FAILURE OF J. M. BARRIE**

Ashley Locke and Dan Terkla\*  
English Department, Illinois Wesleyan University

J. M. Barrie's literary contributions have been pigeonholed for far too long as mere sentimentality, or dark psychological autobiography. His major and lasting work, *Peter Pan* (1904), is frequently viewed as nothing more than a mawkish, Edwardian glorification of boyhood, or, worse, a text fraught with Freudian revelations of a man obsessed with this mother, his dead brother, sexual impotency, and little boys. While both of these critiques contain fair and valid truths (Barrie and his psychology are often thinly veiled within his novels and plays) these two approaches have caused an unfortunate stagnancy in the analysis of Barrie's work and his contributions to literature.

The scope of Barrie's work has also been largely ignored. His plays, naturally, receive the most critical attention, as do a few of his novels. His journalistic works are by far the most under-explored and under-documented. Barrie launched his career as a writer by working as a freelance journalist in London between 1885 and 1889. During those four years, Barrie contributed hundreds of articles to over twenty-one British periodicals. The bulk of Barrie's articles were published by editor Frederick Greenwood in a conservative evening paper, *The St. James's Gazette*.

Barrie's articles for *The St. James's Gazette* deserve greater attention. Barrie was a prolific and successful journalist, and to ignore this important part of his career is to miss the birth of Barrie's life-long dissatisfaction with British society, and his struggle to find a solid personal identity. A closer reading of Barrie's previously unanalyzed contributions to *The St. James's Gazette* reveals significant themes of social and psychological discontent. This, in turn, sheds new light on his most famous work, *Peter Pan*, and the precursors to *Peter Pan*, namely his 1902 novel, *The Little White Bird*. *The Little White Bird* wrestles with the same overarching themes of social disconnection and identity crisis that emerge in *The St. James's Gazette* articles. Using *The St. James's Gazette* articles as the key to this later novel, new possibilities emerge for the exploration of Barrie's work.



Oral Presentation O7.4

**SCHOOL / RECESS**

Douglas R. Pietrzak and Michael Theune\*

Educational Studies/English Departments, Illinois Wesleyan University

The movement for standardization essentially derives from the hope that all schools can be improved by instituting a set of standards and holding teachers and schools accountable for them. The standardization movement is based on the principal that teaching can be measured and its results can be empirically validated. The problem that standardization encounters is that schools lack the kind of consistency necessary for such a scientific treatment. Instead of aiding in the classroom, standardization is negatively prescriptive in form, which is disingenuous to the standards it claims to uphold, constrictive to the teachers, and devoid of any practical means of measuring its own standards. In order to reach a better understanding of standards, student teachers are required to reflect in an essay form on their own experiences relating to these standards. The form that Illinois State Standards are presented in as well as the form that reflections are written in are prescribed and largely influence the content. In order to circumvent this problem, I wrote a collection of poetry in a range of forms and from a multitude of perspectives reflecting on the current educational system as well as my own experience as a student. Essentially, this project hopes to expose the intangible magic of the educational system that cannot be regimented in an attempt to seek a deeper understanding.

**POSTER SESSION A**

**9:00 - 10:00 a.m.**

Odd-Numbered Posters

**POSTER SESSION B**

**1:15 – 2:30 p.m.**

Even-Numbered Posters

Note: Student's name is underlined, faculty advisor designated with \*

During each poster session the author will be present to discuss her or his research with conference attendees, and answer questions.

Please remove your posters at 4:00 p.m.

Poster Presentation P1

**BACTERIOCHLOROPHYLL A BIOSYNTHESIS: CHARACTERIZATION OF  
BCHC FUNCTION IN RHODOBACTER CAPSULATUS**

David H. Aggen and David Bollivar\*  
Biology/Chemistry Departments, Illinois Wesleyan University

*Rhodobacter capsulatus* is a purple, non-sulfur photosynthetic bacterium that produces multiple proteins required for the conversion of chlorophyllide a to bacteriochlorophyll a for photosynthesis to occur. A cascade of enzymes is required for this conversion, one of which is BchC. The expression of these enzymes is highly regulated at the transcriptional level by extracellular conditions. The function of BchC has not yet been elucidated, but sequence homology suggests that this enzyme is a decarboxylase (Scheme 1). A point mutant that disrupted the BchC gene was explored. The mutant strain produced a large quantity of porphyrin intermediates that were difficult to separate from the bacteriochlorophyll product and could not be resolved by NMR or mass spectrometry. The inability to separate these compounds has led to the creation of a BchC knock-out strain of *R. capsulatus* that is disrupted by a kanamycin resistance cassette. This knock-out strain should produce solely the substrate of BchC in sufficient quantity that BchC function can be explored by in vitro assays and the substrate of BchC can be fully characterized.

Poster Presentation P2

**THE EFFECTS OF  $\beta$ -MERCAPTOETHANOL ON THE SPECIFIC  
ACTIVITY OF PORPHOBILINOGEN SYNTHASE MUTANTS OF THE  
RHODOBACTER SPHAEROIDES PROTEIN**

Trefan Archibald and David Bollivar\*  
Biology Department, Illinois Wesleyan University

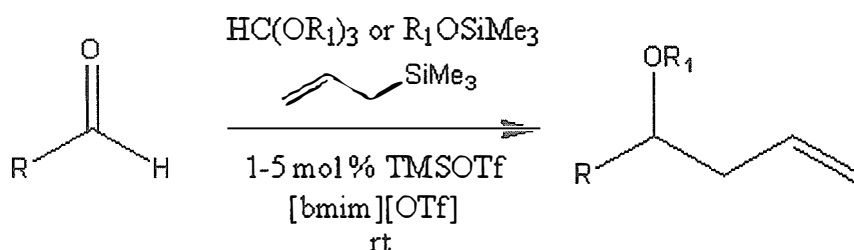
The enzyme porphobilinogen synthase (PBGS), catalyzes the conversion of two molecules of  $\beta$ -aminolevulinic acid (ALA) into porphobilinogen (PBG) in the first common step of the tetrapyrrole biosynthesis pathway. Products of this pathway are widespread, important, and include heme, chlorophyll and cobalamin (vitamine B12). Understanding this enzyme has important clinical implications also. There appear to be at least two classifications of PBGS enzymes when a comparison between species is performed. This classification is based on mono- or divalent cations dependence. One class has a catalytic zinc atom, and the presence of zinc in the active site is linked to the presence three cysteines in that active site sequence. Based upon the E. coli PBGS crystal structure these cysteines have been observed to coordinate a zinc cation. Only one of these cysteine residues is present in the Rhodobacter capsulatus enzyme which is extremely similar to the R. sphaeroides enzyme, but is not affected by the addition of reducing agents. The R. capsulatus enzyme lacks the other of the cysteines are proposed to potentially be involved in formation of the disulfide bond. To test if the cysteines that are present in the R. sphaeroides but not in R. capsulatus enzyme are responsible for the dependence of R. sphaeroides on a reducing agent ( $\beta$ -mercaptoethanol), site-directed mutagenesis will be performed. The cysteine residue that are present only in R. sphaeroides will be mutated to what appears at the corresponding position in R. capsulatus. After creation of these mutations is confirmed through sequencing, the altered enzyme will be purified and tested for  $\beta$ -mercaptoethanol sensitivity.

Poster Presentation P3

**A ONE POT SYNTHESIS OF HOMOALLYL ETHERS FROM ALDEHYDES IN AN IONIC LIQUID**

Peter W. Anzalone and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

The synthesis of homoallyl ethers from aldehydes typically requires two steps formation of the acetal and its subsequent allylation. We have developed a one-pot method for the synthesis of homoallyl ethers from aldehydes catalyzed by TMS triflate in the ionic liquid [bmim][OTf]. This methodology is attractive because it allows allylations to be carried out at room temperature. Ionic liquids offer a convenient and environment-friendly replacement for  $\text{CH}_2\text{Cl}_2$ , the commonly used solvent for such reactions.



Poster Presentation P4

**ETHANOL EFFECTS ON REWARD VALUE JUDGMENT FOLLOWING  
INFUSIONS INTO THE AMYGDALA: IMPLICATIONS FOR  
EMOTIONAL PROCESSING**

Stephanie M. Brewer and Joseph Williams\*  
Psychology Department, Illinois Wesleyan University

Alcohol, when delivered systemically, leads to impaired performance on a variety of tasks, including emotionally-laden or reward value tasks. It is also known that lesions to the amygdala produce emotional or reward value deficits. However, it is unknown whether the emotional deficits observed after alcohol ingestion are due to alcohol's direct effect on the amygdala. The present study examined the effects of alcohol when infused directly into the amygdala on emotional memory and judgment. Twelve male Long-Evans rats were trained on a behavioral task to associate one sweetness level with a reward and another sweetness level with no reward. Once the rats learned to discriminate between reward and no reward stimuli, they underwent surgery to implant guide cannulae to directly infuse alcohol into the amygdala. After a week recovery period, rats were given bilateral infusions of a 1.0% solution of alcohol, a 0.1% solution of alcohol, or a saline infusion. Results will be discussed. It is predicted that rats will perform more poorly on the task with the high dose of alcohol, somewhat poorly on the task with the low dose of alcohol, and that there will be no change with the saline infusion.

Poster Presentation P5

**CONCEPTS OF ADDICTION: ASSESSING THE BELIEFS OF ADDICTION IN  
UNIVERSITY AND TREATMENT CENTER POPULATIONS**

Krystle Balhan and James Dougan\*  
Psychology Department, Illinois Wesleyan University

This study sought to identify differences in the beliefs about addiction between a sample of university students and a sample of clients diagnosed with substance abuse or dependence from a drug/alcohol treatment center. It was hypothesized that treatment center clients would present beliefs that correspond to the disease concept of addiction (Jellinek 1960), while members of the university sample would express more personal or environmental attitudes towards addiction. To assess these potential differences, a survey questionnaire based on the Addiction Belief Inventory (ABI) was administered to both samples (Luke, Ribisl, Walton, and Davidson, 2002). The ABI is divided into eight subscales, and ANOVAs between the university and treatment samples will be calculated for each subscale.

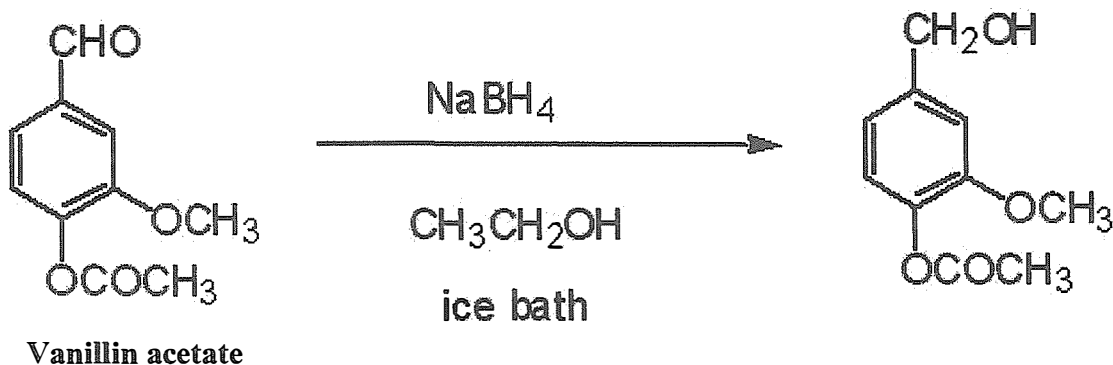
Poster Presentation P6

THE DISCOVERY APPROACH TO ORGANIC CHEMISTRY  
SELECTIVE REDUCTION OF ALDEHYDES IN THE PRESENCE OF ESTERS

Ashvin R. Baru and Ram S. Mohan\*

Chemistry Department, Illinois Wesleyan University

Chemoselective reductions are very valuable in organic synthesis and are routinely discussed in a sophomore organic chemistry course. Yet, there are very few examples of laboratory experiments that illustrate such chemoselectivity. We have developed two discovery oriented lab experiments that illustrate the chemoselective reduction of aldehydes in the presence of esters using  $\text{NaBH}_4$ . The experiments involve the reduction of vanillin acetate and methyl 4-formylbenzoate, using sodium borohydride, followed by product identification using  $^1\text{H}$  NMR and  $^{13}\text{C}$  NMR spectroscopy. Product identification is also achieved by classical qualitative functional group tests. The added element of discovery insures that student interest and enthusiasm are retained.





Poster Presentation P7

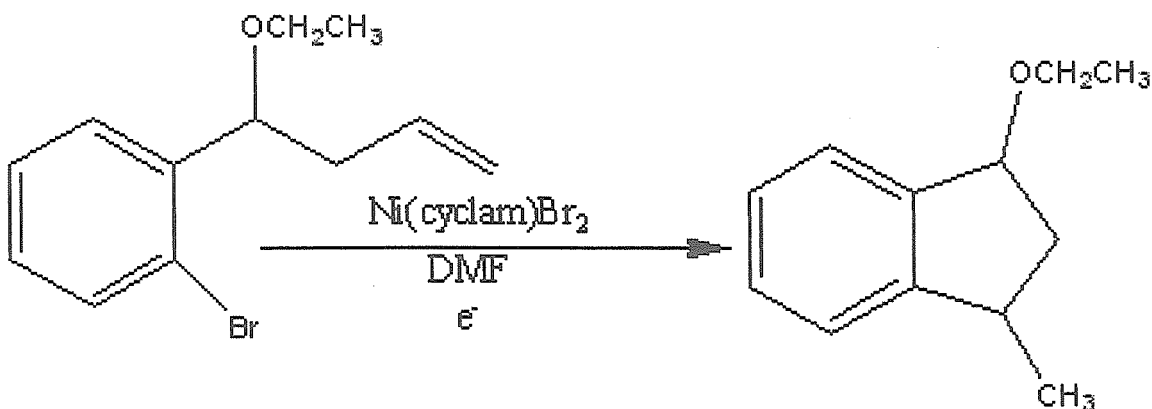
## THE ELECTROCHEMICAL CYCLIZATION OF HOMOALLYL ETHERS TO INDAN RINGS

Eric D. Bell, Ashvin R. Baru, Elisabet Dunach, and Ram S. Mohan\*

Chemistry Department, Illinois Wesleyan University

Chemistry Department, Université de Nice-Sophia Antipolis, Nice, France

Homoallyl ethers are useful starting materials for the synthesis of a variety of organic molecules. We have developed an efficient synthesis of indan skeletons by a Ni(II)-catalyzed electrochemical cyclization of *o*-halosubstituted homoallyl ethers. The homoallyl ethers are synthesized from the corresponding aldehydes either via the acetal or by a one-pot method, which involves *in situ* generation of the acetal.



Poster Presentation P8

**STABILIZING A [4Fe-4S] CLUSTER TO OXYGEN: EFFECTS OF AMINO ACID SUBSTITUTIONS NEAR THE CYSTEINE LIGANDS IN THE FNR TRANSCRIPTION FACTOR**

Robin D. Johnson, Lindsay A. Sicks, Maura K. Bates, and Erin N. Fleck  
and Laura Moore\*

Chemistry/Biology Departments, Illinois Wesleyan University

The FNR protein is an oxygen-sensing transcription factor found in the facultative anaerobe *Escherichia coli*. Dimerization and DNA binding of wild type FNR are coupled to the incorporation of a [4Fe-4S] cluster, which is ligated by cysteine residues at positions 20, 23, 29, and 122.

In the presence of molecular oxygen, this cluster degrades causing a conformational change that renders the protein inactive. Previous research has shown that the Leu28His mutant FNR protein has an oxygen stable [4Fe-4S] cluster. Several more amino acid substitutions have been made at residues adjacent to the cysteine ligands. The *in vivo* activity of these mutant FNR proteins has been evaluated by beta-galactosidase assays under aerobic and anaerobic conditions. Most of the mutant proteins retained similar activity to that of the wild type protein, with significant activity under anaerobic condition and little activity under aerobic conditions. However, replacement of the Leu28 with Lys or Arg resulted in proteins that are active under aerobic conditions.

These results suggest that a basic amino acid residue at position 28 stabilizes the cluster to oxygen. The Leu28Lys FNR protein has been isolated and preliminary characterization of its [4Fe-4S] cluster by absorption spectroscopy shows that like the Leu28His FNR protein, the [4Fe-4S] cluster in Leu28Lys FNR is stable in the presence of oxygen.

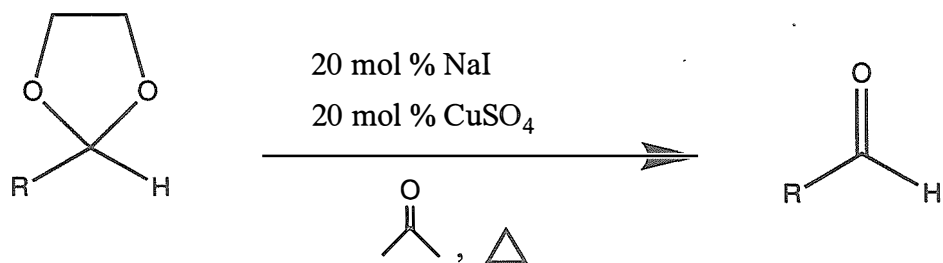
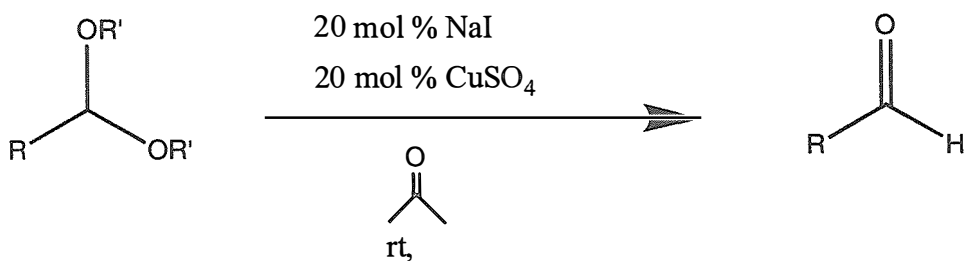
The [4Fe-4S] cluster of the Leu28Lys mutant protein is currently being further characterized in order to give a better understanding of how a basic amino acid at position 28 helps to stabilize the cluster in the presence of oxygen.

Poster Presentation P9

**A MILD METHOD FOR THE DEPROTECTION OF ACETALS  
UNDER NEUTRAL CONDITIONS**

Aaron D. Bailey, Peter W. Anzalone, and Ram S. Mohan\*  
Chemistry Department, Illinois Wesleyan University

Although several methods exist in the literature for deprotection of acetals, few of these methods work at neutral pH. The deprotection of acetals has been accomplished under neutral conditions by using  $I_2$ , generated *in situ* from 20 mol % NaI and 20 mol %  $CuSO_4$  in acetone. The deprotection of acyclic acetals proceeds smoothly at room temperature while cyclic acetals require reflux conditions.



Poster Presentation P10

**A TAXONOMIC STUDY OF THE LICHEN GENUS RIMELIA IN THE GREAT SMOKY MOUNTAINS NATIONAL PARK**

Erin Boente and Jonathan Dey\*

Biology Department, Illinois Wesleyan University

A lichen is a fungus that grows in a symbiotic relationship with a photosynthetic green alga or cyanobacterium. *Rimelia* species are broad-lobed, foliose lichens that have been recently segregated from *Parmotrema*. Distinctively, the former's lobes are strongly maculate (spotted) in a reticulate pattern (and are often cracked) and they produce rhizines on their lower cortex all the way to the lobe margins.

The 1997 National Park Service checklist of lichen species in the Great Smoky Mountains National Park (GSMNP) included only two *Rimelia* species (*R. reticulata* and *R. subsidiosa*). Field and laboratory work by Jonathan Dey and Illinois Wesleyan University undergraduate students (Rebecca Rincker and Holly Grey in 1998; Jana Rose and Adrienne Gagnon in 2000; Emily Richter and Sarah Mick in 2003) pointed to the presence of additional species of *Rimelia* in the GSMNP. As a result, we have undertaken an examination of all *Rimelia* specimens previously collected in the GSMNP and deposited in the lichen herbarium at Illinois Wesleyan University in order to update the species list for the Park and to produce an identification key and descriptions to all species of *Rimelia* in the GSMNP.

As a result of this study, five species of *Rimelia* are now known to occur in the GSMNP. *Rimelia cetrata*, *R. commensurata*, and *R. simulans* are newly reported in the Park to go with the previously known *R. reticulata* and *R. subsidiosa*. *Rimelia diffracta* occurs in the southern Appalachian Mountain region but has not yet been found in the Park. The additional products of this study include an identification key to *Rimelia* species and species descriptions including morphology, secondary product chemistry, local ecology, general distribution, a list of specimens examined, and GSMNP distribution map.

This study is a part of the All Taxa Biodiversity Inventory (ATBI) of the GSMNP, a large endeavor where scientists and educators are working collaboratively to determine all the organisms that can be found in the park.

The work reported here is a portion of Erin Boente's Research Honor's Project in the Biology Department at IWU. She is also working on two other genera---*Canoparmelia* and *Canomaculina*---in the GSMNP.

Poster Presentation P11

**BEHAVIORAL CONTRAST IN A ZOO ENVIRONMENT**

Sarah Bennett and James Dougan\*

Psychology Department, Illinois Wesleyan University

The ethical treatment of zoo animals has become increasingly important over the last thirty years. Although many studies have examined means by which to improve zoo conditions, most have not been closely tied to modern learning theory. In the present study, quantitative analysis (a modern approach to learning) is applied to zoo research to examine behavioral contrast in a zoo environment. Data from a previous study in which foraging tubes (tubes that are capped at the ends and filled with food reinforcers) were presented on concurrent schedules to two Malaysian Sun Bears were reanalyzed. While the tubes in the unchanged group maintained the same level of the reinforcer, the tubes in the changed group contained less reinforcer during the contrast phase than during the two baseline phases. Preliminary results favor the theory of behavioral contrast, as the duration of contact with the unchanged tubes increases as an effect of decreased reinforcement in the changed tubes.

Poster Presentation P12

**ORGANIC FARMING AND THE FUTURE FOR  
ILLINOIS WESLEYAN UNIVERSITY**

Tina Brionez and James Simeone\*

Political Science Department, Illinois Wesleyan University

The family farm is dying, while more and more corporations with their giant farms using chemicals, pesticides, and genetically modified organisms pose more of a threat to our health. In a report published in 2000, the FDA found pesticide residues in over sixty percent of fruit, thirty percent of vegetables, and thirty-eight percent of grains tested. Organic farming is actually the truest, oldest form of farming, and is making a comeback. USDA statistics show the consumer demand for organic food is growing twenty percent each year for the past fifteen years, and this is especially evident when looking into the kitchens of colleges and universities. Incorporating organic farming into the way of life of Illinois Wesleyan University students, faculty and staff would uphold their commitment, which is stated in their mission statement, as "committed to diversity, social justice, and environmental sustainability". Not only does organic farming enrich the way individuals eat, but it improves the environment and can bolster the local economy. The movement towards organic farming is happening all around the country, and Illinois Wesleyan University is in a perfect position to join other colleges and universities in the fight for healthier soil, air and water, a healthier plate of food, and a healthier state of mind. Illinois Wesleyan reflects values in the lessons they teach, the buildings they build, the professors they hire. It is now time to reflect that in our dining areas as well.

Poster Presentation P13

**SYNTHESIS OF 4-SUBSTITUTED OXAZOLIDINONES USING PRIMARY,  
SECONDARY, AND TERTIARY ALCOHOLS**

Scott Brombosz and Jeffrey Frick\*  
Chemistry Department, Illinois Wesleyan University

Oxazolidinones are an interesting and relatively new class of antibiotics that have recently gained much attention for their effectiveness against certain drug resistant bacteria. The focus of this project has been to synthesize 4-substituted oxazolidinones from a bicyclic aziridine. This has been accomplished by utilizing a Lewis acid catalyzed ring opening reaction with various alcohols. The results from this study with primary, secondary, and tertiary alcohols will be presented.

Poster Presentation P14

**PIECING TOGETHER THE PUZZLE OF LITERACY**

Mitchell Brookins and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

Past research studies have made it quite clear that there are various ways to enhance literacy in the classroom. This research project ventured to find out strategies educators can use to promote literacy. Data was collected from literary sources, classroom observations, assessment tests given to students, and interviews with educators. Results affirmed previous research findings that an educator should utilize strategies such as whole language, skills-based learning, literature circles, and a host of others to reach the various learning styles in the classroom. It is suggested that educators must be mindful of the different skills of their students and use various approaches to cater to those needs.



Poster Presentation P15

**MUSIC INTEGRATION TO ENHANCE STUDENTS' LEARNING**

Jordan Burton, Diana P. Jirschele, and Leah Nillas\*  
Educational Studies Department, Illinois Wesleyan University

With the growing body of evidence suggesting the link between music and intelligence, there is a parallel dialogue about music in our schools and in programs of childhood development. Influenced by the research found on the importance of music in elementary schools, this research study illustrates how integration of music in daily curriculum at the elementary level enhances students learning. Data was collected from a variety of literary sources and interviews with educational professionals. Results suggest that music, as a part of education, allows children to flourish in their natural curiosity within a stimulating environment and provides concrete evidence supporting the further utilization of music in the classroom.

Poster Presentation P16

**POLYDENTATE MACROCYCLIC COMPLEXES AS  
POTENTIAL OXIDATION CATALYSTS**

Phillip Butler and Rebecca Roesner\*  
Chemistry Department, Illinois Wesleyan University

The chemotherapeutic agent bleomycin is believed to oxidize its substrates through an iron-hydroperoxo intermediate. In efforts to mimic the bleomycin active site, we have prepared a series of polydentate macrocyclic ligands through the condensation of 2,6-pyridinedicarboxylic acid dimethyl ester with various linear tri- and tetra-amines. In several cases, the secondary amino groups of the macrocyclic ring were subsequently alkylated with methyl, ethyl, or picolyl groups. Another method of synthesis is now being used by the group to first alkylate linear tetra-amines and then condense them with 2,6-pyridinediacidchloride for formation of the desired macrocycles. Ongoing work includes optimizing this alternate method of synthesis for the preparation and characterization of iron complexes.

Poster Presentation P17

**THE ROLE OF PSYCHOPHYSIOLOGY IN USABILITY TESTING**

Qiana Cryer, Stephanie Reynolds, and John Ernst\*  
Psychology Department, Illinois Wesleyan University

Usability involves the testing of products for convenience and practicality. This study aims to test whether psychophysiological tools can be used in usability research. Physiological responses, such as heart rate and blood pressure were measured in order to test stress responses in users. Participants were computer science majors and non computer science majors. Each participant was hooked up to cardiovascular equipment and asked to complete a web-based task. The participants were assigned to a threatening or non threatening condition, and performed the task on both well and poorly designed websites. We hypothesize that computer science majors will show less stress relative to non computer science majors, and participants in the threat condition will show more stress relative to those in the non threat condition. Our research will help us better understand how to test new software and potential long term cardiovascular responses to using computer software.

Poster Presentation P18

**I AM SHERAZADE: DEVISING THE ARABIAN NIGHTS**

Alison Daigle and Sara Freeman\*  
School of Theatre Arts, Illinois Wesleyan University

The goal of this project was to create a functional piece of theatre based off the *Tales of the 1001 Arabian Nights* and the central figure of Sherazade. The early stages of the project were devoted to research about the *Tales* themselves, the many faces, incarnations, and associations of Sherazade herself, and the practice of devising a theatrical performance that is based not on a script but rather on a body of research, a collection of themes, and a story set. The second stage of the project was working on the performance: rehearsal began with seven actresses and a designer on a six-week process of exploration based on research followed by a five-week process of development based on discovery. The end result was given public performances in early April. The contents of this presentation will include how themes and staging ideas were gleaned from research, what the rehearsal process was like, and materials from the final performances.

Poster Presentation P19

**HETEROLOGOUS EXPRESSION, PURIFICATION, AND  
CHARACTERIZATION OF PORPHOBILINOGEN SYNTHASE FROM  
RHODOBACTER SPHAEROIDES**

Jason Dulac, Trefan Archibald and David Bollivar\*  
Department of Biology, Illinois Wesleyan University

The enzyme porphobilinogen synthase (PBGS, EC 4.2.1.24) catalyzes the first common step in the biosynthesis of tetrapyrrole pigments-- such as heme, chlorophyll, and vitamin B12 (cobalamin)-- by converting two molecules of d-aminolevulinic acid (ALA) into porphobilinogen (PBG) 1. PBGS is categorized by presence or absence of catalytic and allosteric metal ions. All known PBGS sequences contain either a catalytic zinc ion or an allosteric magnesium ion except for those sequences expressed by *Rhodobacter capsulatus* and *Rhodobacter sphaeroides* 2. This study presents initial efforts to characterize PBGS in *R. sphaeroides* in order to better-understand the enzyme's unique characteristics. Evaluating ion dependence for *R. sphaeroides* PBGS is especially important due to an observed dependence upon divalent cations in the majority of known PBGS enzymes. Protein assays were carried out to determine the effect of various ions including monovalent cations ( $\text{Na}^+$ ,  $\text{NH}_4^+$ ,  $\text{K}^+$ ), divalent cations ( $\text{Mg}^{2+}$ ), and divalent anions ( $\text{SO}_4^{2-}$ ). Additionally, substrate concentration was altered for use in  $K_m$  and  $V_{max}$  determinations at varying pH values. The observation that specific activity shows protein concentration dependence suggests that PBGS can dissociate into smaller and less active subunits.

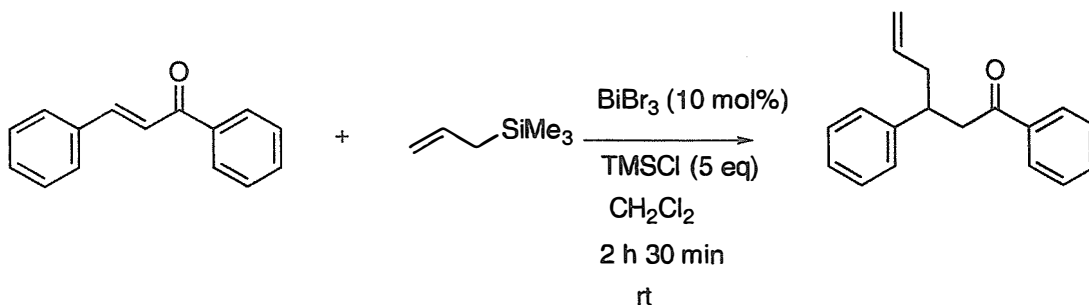
Poster Presentation P20

**BISMUTH COMPOUNDS IN ORGANIC SYNTHESIS: ADDITION OF ALLYLSILANES TO  $\alpha,\beta$ -ENONES**

Christopher M. Duncan and Ram S. Mohan\*

Department of Chemistry, Illinois Wesleyan University

The conjugate addition of allyltrimethylsilanes to  $\alpha,\beta$ -enones catalyzed by  $\text{TiCl}_4$  is a useful method to form carbon-carbon bonds. However, the use of stoichiometric amounts of  $\text{TiCl}_4$ , which is corrosive and difficult to handle, makes this procedure less attractive. We report that  $\text{BiBr}_3$  in the presence of trimethylsilylchloride efficiently catalyzes the conjugate addition of allyltrimethylsilane to  $\alpha,\beta$  enones. Bismuth compounds are attractive because they are remarkably low in toxicity and easy to handle. The results of this study will be presented.



Poster Presentation P21

**THE EFFECT OF A GIBBERELLIN BIOSYNTHESIS INHIBITOR  
ON GROWTH**

Kelly Feder and Loni Walker\*  
Biology Department, Illinois Wesleyan University

Gibberellins are plant hormones that have been shown to effect fruit growth, germination, and internode elongation in flowering plants. Gibberellins have been studied extensively in flowering plants but little research has been performed in mosses.

Previous research at Illinois Wesleyan University has demonstrated that the moss *Ceratodon purpureus* (Hedw.) Brid. has gibberellins or gibberellin-like substances that regulate growth. A chemical identification as well as a physiological characterization of gibberellins has been undertaken as a follow up to the initial research. The results presented here suggest that gibberellins or gibberellin-like substances regulate both cell elongation and cell division in the moss *C. purpureus*.

Poster Presentation P22

**TEACHING STYLES: WHICH ONE WILL YOU CHOOSE?**

Patrick Fischer, Hannah Meharry and Leah Nillas\*  
Educational Studies Department, Illinois Wesleyan University

Although teaching is an age old practice, there are new teaching methods and strategies developed constantly. Recently, the trend has been to move away from the tradition lecture system to a more hands on or tactile based method. The main question to ask ourselves is: Which of these methods students learn more from? Recent research shows that most teachers believe the tactile learning system has more benefit to students. This study includes surveys of two high school Geometry classes and interviews with students and teachers, to examine their perceptions about the subject. This study suggests that different learning styles are linked to the teaching style which helps the students learn better. Teachers should take into account their students learning styles in deciding which teaching method to use.



Poster Presentation P23

**MULTISTEP SYNTHESIS OF ASYMMETRIC ORGANOPHOSPHORUS  
ANALOGS OF ACETYLCHOLINE**

Jonathan Kaplan, Dan Flaugh, and Jeffrey Frick\*  
Chemistry Department, Illinois Wesleyan University

Acetylcholinesterase is an enzyme which catalyzes the hydrolysis of acetylcholine, causing the relaxation of smooth, cardiac, and skeletal muscle contractions in the human body. One class of compounds that inhibit acetylcholinesterase is the organophosphates. While the mechanism of inhibition is fairly well understood, much less is known about the stereochemical aspects of inhibition. Our research involves the multi-step synthesis of organophosphorous analogs of acetylcholine which have similar size and functionality of that of acetylcholine, but that also contain two chiral centers. Once prepared, these analogs could then be used to learn more about the active site of acetylcholinesterase and also to learn about the stereochemistry involved in the phosphorylation of acetylcholinesterase. We are currently working on separating pairs of diastereomers, which will eventually lead to the production of the desired analogs.

Poster Presentation P24

**WHAT ABOUT ME? AN LD STUDENT IN A MAINSTREAM CLASSROOM**

Jennifer Freeman and Leah Nillas\*  
Educational Studies Department, Illinois Wesleyan University

Mainstreaming is an important issue of today as many teachers are finding more and more learning disabled (LD) students in their classrooms. It is a challenge to ensure the social and academic inclusion of these students. Through interviews and observations, this case study addresses whether or not an LD student's needs are being met in a mainstream classroom. This research focuses on the experiences and needs of an LD student in an inclusive classroom. The findings show that, while inclusion can be beneficial, there are LD needs that are not met in a mainstream classroom. Enhancement of teaching techniques to meet those needs is highly encouraged.

Poster Presentation P25

**MEN'S OBJECTIFICATION OF WOMEN**

Kathleen Garibaldi, Ellen Perry and John Ernst\*  
Psychology Department, Illinois Wesleyan University

This study investigated men's objectification of women. Objectification is the evaluation of individuals based upon their external characteristics rather than internal characteristics. Pilot data had revealed two significant effects. Men scoring high in objectification relative to men scoring low in objectification had better recall for job candidates physical attributes. Men who scored low on objectification relative to those scoring high had better recall for job candidates job qualifications. Part one of our study contained questionnaires administered to both male and female undergraduate students, including the men's objectification of women measure. This measure of men's objectification of women has previously been shown to have both high internal consistency and good test-retest validity. Part two, two weeks later, included only male participants, and mimicked a job interview situation in which participants were provided with both paper resumes and video footage of potential candidates. After a distracter task, a memory recall test was preformed. We hypothesize that data analysis will again demonstrate that men scoring high in objectification relative to men scoring low in objectification will have better recall for job candidates physical attributes; men who scored low on objectification relative to those scoring high will have better recall for job candidates job qualifications. These results have important implications for not only job interviews but for any situation in which initial judgments impact future interactions.

Poster Presentation P26

**PERCEIVED QUALITY OF ASIAN BRANDS IN THE  
AUTOMOBILE INDUSTRY**

Adrien Gatesman and Margaret Chapman\*  
Economics Department, Illinois Wesleyan University

The Big Three American Automobile brands, Ford, Chrysler, and GM, have seen consistently dwindling market share in the US market for over a decade. They are in fierce competition with foreign brand names, specifically Asian companies such as Honda, Nissan, and Toyota. Asian brands have become best sellers in the passenger car market and American brands are redesigning their cars to try and keep up.

My research uses Lancaster's Theory of Consumption, the view that people consumer bundles of characteristics, to determine why Asian cars are becoming so popular. I use the hedonic pricing model to determine how much consumers are willing to pay for certain quality characteristics and brand names. I include dummy variables for each brand in the model as well as variables for size, performance, gas mileage, safety and reliability.

Poster Presentation P27

**BORROWED MEANINGS: THE APPROPRIATION AND  
COMMODIFICATION OF NATIVE AMERICAN CULTURE**

Angela Glasker and Charles F. Springwood\*  
Anthropology Department, Illinois Wesleyan University

The appropriation and commodification of Native American culture is a broad, complex problem affecting all Native groups in one form or another. This appropriation and commodification includes all aspects of Native identity and culture: land, religion, material culture, and even human remains. Many of the appropriated items have become symbols of American Indian identity, and because of this, they have become a commodity. There is money to be made by both Natives and non-Natives in the sale of cultural items, whether or not those items are in fact authentic, because they are symbols that represent the foreign, and often times romanticized, other. I have chosen to focus on the appropriation and commodification of material culture. I will be using two specific examples, Hopi katsinam and Ojibwe dream catchers, to illustrate how appropriation and commodification can affect Native material culture and the problems that are dealt with concerning that appropriation and commodification.

Poster Presentation P28

**THE EFFECT OF GENDER AND CULTURAL EXPECTATIONS ON YOUNG  
WOMEN IN THE FIGHT AGAINST HIV/AIDS**

Myla Green and William Munro\*

Political Science Department, Illinois Wesleyan University

Studies on rising HIV/AIDS rates have shown a variety of factors influencing the heightened vulnerability of South African women. Even though young people generally have an adequate understanding of HIV/AIDS, their infection rates continue to increase. Societal norms and traditional gender roles render women more vulnerable to contracting the disease, in part by denying women the rights to ensure safe sex and monogamous relationships. Accepted norms regarding men's sexual "needs" and standard sexual conduct in relationships have influenced the low success rate of condoms in preventing transmission. This presentation will examine how and why these norms, attitudes, HIV/AIDS education, governmental roles, individual economic incentives, and other factors contribute to South African young women's disadvantage in the fight against this epidemic.

Poster Presentation P29

**BOOKS COME IN ALL COLORS: MULTICULTURAL EDUCATION  
IN THE ENGLISH CLASSROOM**

Bridget Haddad-Null and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

While multicultural education is an increasingly popular theoretical movement in schools across America, many educators remain uninformed as to how to best put the movement's theories into practice in their classrooms. This study describes the best practices for incorporating multicultural education into the high school English curriculum. Three high school English teachers dedicated to multicultural education were interviewed and current research studies on multicultural education were reviewed. The findings of the study support a holistic approach and full commitment to incorporating multicultural education in the English curriculum. A holistic approach is complicated, however, by other demands of traditionalism and standardization, but these demands can be overcome by the truly committed multicultural educator.

Poster Presentation P30

**THE NATURE OF INTUITION**

Matthew J. Hendrickson and Jean Pretz\*  
Psychology Department, Illinois Wesleyan University

Previous studies on intuition have had mixed results and incomplete methodology. Many of these studies have used only self-report data, and even fewer have used behavioral measures to assess individuals' use of intuition. In addition to addressing this methodological issue, we explored the theoretical distinction between the use of intuition in cognitive tasks versus interpersonal or emotional situations. Self-report and behavioral measures of both cognitive and emotional intuition were selected, thus creating a 2x2 design. Preliminary findings supported the distinction between cognitive and emotional types of intuition; however, self-reported use of intuition did not predict successful use of intuition on the behavioral measures. These findings suggest that there should be further studies dedicated to examining the theoretical distinction between cognitive and emotional intuition. In addition, researchers should recognize the limits of self-report measures of intuition and adopt behavioral measures in future studies.



Poster Presentation P31

**ROLE TAKING VS. CULTURAL IDENTITY: DEFINING DISABILITY IN AN  
ABLE-BODIED ENVIRONMENT**

Elizabeth Holman and Njeri Mbugua\*  
Sociology Department, Illinois Wesleyan University

Through my own personal experience with a temporary disability, I examined the labels placed on people with disabilities, both by the disabled themselves and by society in general. While minority group membership has a variety of social, psychological, and legal advantages, it forces people to give up some individuality and gives the disability a more permanent connotation (Berbrier, 2004; Watson, 2002). Alternately, viewing disability as a role, and attaching the label "disabled" in certain circumstances, allows for a broader spectrum of individual choice. However, the label assumes someone who is disabled to be "less than able," thus carrying a strong stigma. It is my conclusion that the lived experiences of those with disabilities do not include people self-identifying as a member of the "disabled" community, but that they take on this label only when the environment fails to meet their needs. In effect, identification may become circular because often the only way to change the environment to meet their different needs is to join with others to fight for their common cause in social and political arenas as a minority group.

Poster Presentation P32

**THE CONFORMATIONAL CHANGES IN FNR IN RESPONSE TO  
ANAEROBIC CONDITIONS**

Jena Hudson and Laura Moore\*

Chemistry/Biology Department, Illinois Wesleyan University

The goal of our research is to understand the conformational changes that take place as FNR goes from its inactive to active form. FNR is a protein found in facultatively anaerobic bacteria, which forms an active dimer when oxygen is not present. This dimerization occurs after a [4Fe-4S] cluster is assembled. The dimerized FNR binds to the DNA and activates the transcription of genes necessary for anaerobic metabolic pathways. Since traditional methods of determining protein structure, such as x-ray crystallography or NMR spectroscopy, have not been successful with FNR, we will be using fluorescence to interpret its structure. Fluorescence wavelength varies upon exposure to solvent and will be indicative of the location of the fluorescing amino acid (tryptophan) in the FNR protein.

Since FNR contains no tryptophan and has only minimal fluorescence, due to its tyrosine, we replaced one codon in the *fnr* gene with the codon for tryptophan, the most fluorescent amino acid. All our work was done in plasmids, which allowed us to look at the proteins in vivo and induce overexpression. Our work was done primarily in the dimerization helix, which included residues from 140-160. Of the many mutants made, we selected Q141W and D154W to look at the differences in their fluorescence. Q141W and D154W were both induced with IPTG, to produce FNR protein. The cells were then anaerobically collected, sonicated, ultracentrifuged and run on a Biorex-70 cation exchange column in order to isolate the FNR. Gels show that this process was successful and fluorescence data shows that D154W has a fluorescence emission maximum at 341nm while Q141W emits at 349nm. Unfortunately, UV-vis data suggest no iron sulfur cluster presence in the majority of purified protein in both cases.

Future work involves doing concentration studies to better understand the changes in fluorescence during the dimerization process and looking at the fluorescence of more mutations.

Poster Presentation P33

**MAXIMUM REVENUE VS. MAXIMUM WINS: THE PARADOX OF  
MAJOR LEAGUE BASEBALL**

Adam Houser and Robert Leekley\*  
Economics Department, Illinois Wesleyan University

The world of sports has become a multi-billion dollar industry, with the game of baseball being no exception to this rule. Countless players make more than \$1 million dollars annually and a handful of teams are spending at or above \$100 million on player salaries alone. The obvious question to ask is what can you buy with \$100 million dollars in the game of baseball?

Theoretically, the more money a team acquires, the more that team can afford to spend on players which in turn, should increase the success of the team. The goal of any team should be to maximize wins in an effort to advance to the playoffs, and ultimately, compete in the World Series for the championship trophy. Recent trends indicate that the highest revenue and payroll teams are necessarily winning the most amounts of games and advancing to the playoffs. However, empirical evidence suggests that a possible reason for this is that firms are paying for personnel in an effort to maximize revenue, not wins. Through review of literature, the reader comes to learn that spending money purely on offensive statistics is not the most cost-effective way to run a baseball franchise, but it is the most profitable. Furthermore, empirical evidence suggests that an increase in firm revenues due to increases in player productivity is nullified by an increase through player salary.

Concluding, players have bargained accurately for their salary which means that players are paid their net worth, and that lower-revenue teams face an uphill climb to baseball superiority.

Poster Presentation P34

**AN INTERACTIVE APPROACH TO OPTICAL TWEEZER CONTROL**

Olukayode Karunwi and Miles Padgett\*  
Physics Department, Illinois Wesleyan University

We have developed an interactive user-interface that can be used to generate phase holograms for use with spatial light modulators. The program utilizes different hologram design techniques allowing the user to select an appropriate algorithm. The program can be used to generate multiple beams, interference patterns and can be used for beam steering. We therefore see a major application of the program to be within optical tweezers to control the position, number and type of optical traps.

Poster Presentation P35

**ENDOCRINE DISRUPTING CHEMICALS IN NATURAL WATER SOURCES**

Kelly Lingen and Stephen Hoffmann\*  
Chemistry Department, Illinois Wesleyan University

Endocrine disrupting chemicals (EDCs) have become an increasing concern. These chemicals may mimic hormones and can disrupt the normal functioning of the endocrine system. If they are present in wastewater, they are often not removed by wastewater treatment processes. Therefore, as wastewater treatment effluent is released to the environment, these compounds may cause adverse affects in wildlife, such as a change of gender in various aquatic species or an increase in sterility. Because they are also seldom removed in drinking water purification, humans may also be affected through exposure to these compounds in drinking water from surface water sources. Previous studies show levels of EDCs in several water sources in the microgram per liter range. It is not yet known at what levels EDCs pose a threat to the ecosystem or what levels should be considered safe for human consumption. However, studies indicate that even these low levels of EDCs can be detrimental. Of particular concern are synthetic estrogens originating from pharmaceutical sources, for instance, the oral contraceptive. Four compounds were chosen for study: 17 $\beta$ -ethynylestradiol, 17 $\beta$ -estradiol, 17 $\alpha$ -estradiol, and estrone. From natural water sources, these compounds will be collected through solid-phase extraction and then derivatized to their trimethylsilyl ethers. The samples will then be analyzed by gas chromatography and mass spectroscopy with electron impact ionization and selected ion monitoring.

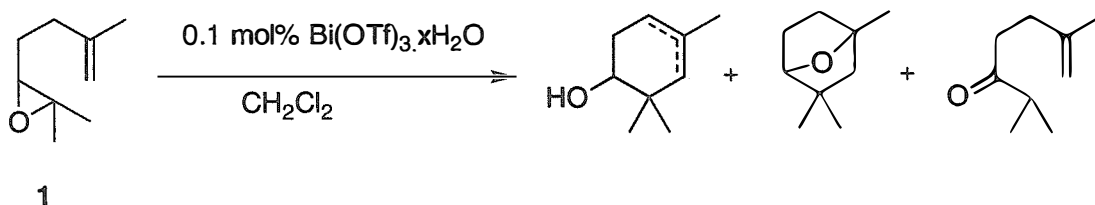
Poster Presentation P36

**Bismuth triflate Catalyzed Olefin-Epoxyde Cyclizations**

Joshua R. Lacey and Ram S. Mohan\*

Chemistry Department, Illinois Wesleyan University

Bismuth triflate is a highly efficient catalyst for effecting an olefin-epoxide cyclization. The cyclization of geraniolene oxide **1** is catalyzed by bismuth triflate as well as a variety of other metal triflates. Advantages of bismuth triflate include its high catalytic efficiency, low toxicity and ease of handling. The effect of catalyst on product composition will be discussed.



Poster Presentation P37

**PINK AND BLUE MAKE PURPLE: GENDER IN THE CLASSROOM**

Jessica Lothman and Venus Evans-Winters\*  
Sociology/Education Departments, Illinois Wesleyan University

Children growing up in the United States educational system have learned stereotyped gender roles. Education is indispensable in empowering the people. It brings out the desired attitudinal and behavioral changes necessary in effecting and sustaining societal development. Educated people are better prepared to make sound decisions about their lives and can contribute more to community development. For women, education provides the vehicle for making choices for themselves beyond the confines of marriage and motherhood. The gap that exists between sex stereotyped gender roles is a social problem that needs to be addressed. It is important to first understand the roots of social problems, so that problems such as unequal pay will not exist. Education should be breaking down the psychological schema that generates the stereotypes of women and men.

Poster Presentation P38

**TAKE A SEAT! EFFECTIVENESS OF ELEMENTARY  
CLASSROOM SEATING ARRANGEMENTS**

Lauren Macey and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

This research examined the different types of seating arrangements (e.g., individual, dyad, groups) teachers commonly use and their overall effectiveness in an elementary classroom. Data was collected through observation during and after student teaching, surveys, and interviews with teachers and students. This research focused on the effectiveness of three common setting arrangements. Like most previous research studies, the emphasis is on identifying which seating arrangement is most beneficial for all students. Previous findings indicated that there has been a high correlation between group seating and student time off-task.



Poster Presentation P39

**MANAGING THE UNMANAGEABLE CLASSROOM**

Becca Marsh and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

One question all first year teachers are faced with is what kind of classroom management strategies they should use in their classroom. This research study looks at approaches to classroom management of several different 5th grade teachers. Classes were observed, student surveys were conducted, and teachers were interviewed in order to have a better understanding of these approaches. Based on previous research studies as well as this one, there are two main forms of classroom management strategies: preemptive and reactionary. This study presents different approaches which first year teachers can choose from as they build their own repertoire of classroom management strategies.

Poster Presentation P40

**LOW LEVEL DETECTION OF ATRAZINE IN BLOOMINGTON-NORMAL  
SURFACE WATER SOURCES**

Michael McAvoy and Stephen Hoffmann\*  
Chemistry Department, Illinois Wesleyan University

Atrazine is classified by the EPA as a restricted use pesticide for its high potential for groundwater contamination. The use of atrazine as a pesticide is restricted only to authorized, trained professionals. Even so, it is estimated that 76.4 million pounds are applied to crops annually. With the possibility of atrazine being applied to crops in the surrounding rural area of Bloomington-Normal present, a method to detect atrazine in natural surface water samples has been developed. Using gas chromatography-mass spectroscopy, a natural sample can be passed through a solid phase extraction cartridge, then eluted with methanol, which is then rotary evaporated to concentrate any organics present in the sample. This can then be injected into the GC-MS for separation and quantitation using a selective ion mode. Isotopically labeled atrazine is also added as an internal standard. Initial studies have shown detection limits as low as 1 ppm in scan mode and 0.1 ppm in selective ion mode. Coupled with the three order of magnitude increase in concentration in the extraction step, this corresponds to a detection limit of 0.1 ppb in the initial surface water sample. Previous studies using an alternate method (immunoassay) suggest that atrazine is present in Bloomington-Normal surface waters at sub-ppb levels (0.1-0.6 ppb). Natural samples from Evergreen Lake, Lake Bloomington, and the Mackinaw River will be collected and spiked in future studies.

Poster Presentation P41

**THE ROLE OF THE HINGE REGION IN THE ACTIVITY OF  
THE PROTEIN FNR IN E. COLI**

Katherine McCulloch and Laura Moore\*  
Chemistry Department, Illinois Wesleyan University

FNR is an oxygen-sensing transcription factor in the facultative anaerobic bacteria *E. coli*. It is part of a family of proteins that includes cAMP receptor proteins (CRP or CAP). These proteins undergo conformational changes in response to specific effector molecules, which in the case of FNR is oxygen. In its functional form, two subunits of the FNR protein form a homodimer through a  $\alpha$ -helix, residues 140 to 160. Adjacent to this helix is a "hinge" or "switch" region at residues 161 to 171, far from the oxygen-sensing domain of the protein. In homologues to FNR, CAP and CooA, it has been shown that this region plays a role in stabilizing the conformational changes involved in the activation process. Residues 161, 169, 170, and 171 in particular are highly conserved in the CRP family. The goal of this project is to study the importance of this switch region in the activity of FNR. Site-directed mutagenesis and  $\alpha$ -galactosidase activity assays were performed to investigate the role of the hinge region in FNR, and they have shown that this region may have less involvement in the activation process than its homologues. Future work will involve reversing the charges of several residues of the hinge region, and analyzing how such a change affects the activity of FNR..

Poster Presentation P42

**AFFORDABILITY IN THE RENTAL MARKET: 1990-2000**

Sean Moran and Robert Leekley\*  
Economics Department, Illinois Wesleyan University

During the mid/late-1990s, the U.S. witnessed housing bubbles spring up in various metropolitan areas across the country. A housing bubble occurs when the sales price of homes increase sharply, due to speculation, compared to all other goods. While bubbles in other industries, such as the tech bubble, have burst, the housing bubble has yet to stop rising. This paper analyzes how demand has driven up these bubbles, but more importantly, what sort of spillover effect this has had on the cost-burden among low-income rental households. When renters are spending more than 30% of their gross income on housing costs, they are considered to be cost burdened .

Renting a home is considered an inferior good to owning a home. Because of this model, rental rates should increase with the housing prices; however, they are not seen to rise as fast as home sales price. In fact, the number of renters per city is seen to be less cost-burdened from 1990-2000.

In this project, I have developed a model to explain what variables cause the change in home price, as well as the change in % cost-burdened. 1990 and 2000 census data compiled by the department of Housing and Urban Development is used to analyze these factors.

Poster Presentation P43

**THE EFFECTS OF NUCLEAR WASTE DISPOSAL AND CONTAMINATION IN  
THE UNITED STATES AND THE FORMER SOVIET UNION**

Shannon O'Rourke and Abigail Jahiel\*

Environmental Studies Department, Illinois Wesleyan University

Although the United States and the Former Soviet Union have had two very different political systems over the years, the way in which the nuclear weapons industry was dealt with in both countries was very much the same. From the beginning of the Cold War, the secrecy surrounding the nuclear industry in both the United States and the former Soviet Union had devastating effects on both the environment and the citizens of the countries. This presentation will examine the nuclear contamination and the effects on the countries that the nuclear industries had. It will draw upon similarities and differences in the two countries and how each country dealt with the problem, leading up to the situation today where both countries still are facing the lasting negative effects. The outlook and any progress that either country has made is hindered by constraints, both financial and governmental, that are forcing citizens to take action.

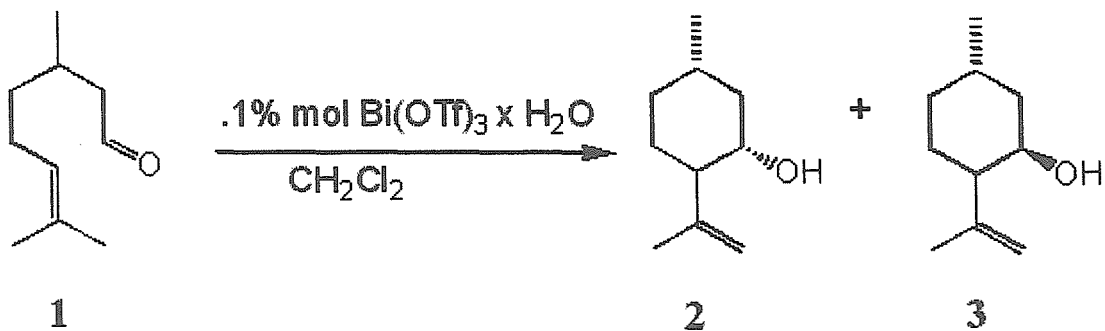
Poster Presentation P44

**BISMUTH COMPOUNDS IN ORGANIC SYNTHESIS: BISMUTH TRIFLATE  
CATALYZED INTRAMOLECULAR CARBONYL ENE REACTION**

Ann C. Palma and Ram S. Mohan\*

Department of Chemistry, Illinois Wesleyan University

The intramolecular *Ene Reaction* is a useful method for forming C C bonds. Bismuth triflate (0.1 to 1 mol %) is a highly efficient catalyst for the cyclization of citronellal, **1**. The cyclization yields isopulegol **2** and its diastereomer **3** in a 2:7 ratio. The effect of solvent and other catalysts on this cyclization have been investigated and will be discussed.



Poster Presentation P45

**DETERMINATION OF STRONTIUM-90 LEVELS IN WHITE-TAILED DEER  
IN RELATION TO THE CLINTON NUCLEAR POWER PLANT**

Keelia Rhoads and R. Given Harper\*  
Biology Department, Illinois Wesleyan University

Strontium-90 is only one of a number of radionuclides (i.e., radioactive isotopes) that are released into the atmosphere by nuclear power reactors. Strontium-90, which has a half life of approximately 29 years, is of particular interest because it is a calcium analogue that accumulates in the bones and teeth of organisms after it is ingested. Upon deposition, strontium-90 decays, releasing two high energy beta particles. Energy from these particles has the potential to cause damage to cells and tissues. Previous studies have suggested that human infant mortality rates and cancer rates increased when nuclear power plants were online compared to when they were offline. Despite the fact that Illinois has more operational nuclear power plants than any other state, radionuclides are monitored and publicly reported by the U.S. Environmental Protection Agency only from the Chicago area. The purpose of our study was to determine if strontium-90 was present in 60 adult (> 1.5 yrs), female white-tailed deer (*Odocoileus virginianus*) harvested by hunters during the 2004 firearm hunting season in counties upwind and downwind from the Clinton nuclear power plant. The teeth were extracted from the deer and were sent to REMS, Inc., a radiochemistry lab in Waterloo, Ontario. The teeth were processed according to standard procedures and Strontium-90 levels were determined via a scintillation counter. Thus far we have preliminary results from teeth extracted from six deer. Five of the six deer contained Strontium-90 at levels higher than naturally occurring background levels of radiation (3-5 picocuries (pCi/L of air)). Mean ( $\pm$  SD pCi/g of Ca) Strontium-90 levels in five deer harvested from DeWitt County, Illinois (the site of the Clinton nuclear plant) ranged from  $6.54 \pm 0.67$  to  $48.14 \pm 3.41$  pCi/g Ca; the overall mean level was  $28.18 \pm 3.43$ . The mean Strontium-90 level from one deer from McLean County, Illinois was  $26.88 \pm 3.23$  pCi/g Ca. Statistical analyses will be performed when additional data are available.

Poster Presentation P46

**LANGUAGE DEFICIENCY AND THE OCCUPATIONAL ATTAINMENT  
OF MEXICAN IMMIGRANTS**

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The number of Mexican immigrants that have entered the U.S. has greatly increased over the past decade. The occupational attainment of these immigrants provides insight into how successful they are in the host country and language deficiency has an effect on this occupational attainment. By controlling for language proficiency, human capital characteristics and other variables from the IPUMS database, this project uses probit analysis to predict the probability that an immigrant will be employed in a favorable occupation in the U.S. Results show that language deficiency reduces the probability of attaining a favorable occupation, but having no English language skills decreases the probability by a lesser amount than if the immigrant had any English language skills. This information is important to the analysis of immigration policy and to language training for immigrants in the United States.



Poster Presentation P47

**ELECTROPHYSIOLOGICAL STUDY OF THE ANTERIOR CINGULATE**

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Theta EEG activity has been well-characterized in the hippocampus, a medial temporal lobe structure essential for learning and memory. For instance, it is known that the medial septal area (MSA) drives hippocampal theta rhythmicity. However, comparatively little is known about the neuroanatomical substrates behind theta activity in other brain areas, such as the anterior cingulate region of the prefrontal cortex. One aim of this study is to address this question by determining whether or not the MSA drives theta rhythmicity in the anterior cingulate as it does in the hippocampus. To meet this aim, EEG recording electrodes will be surgically implanted into the right anterior cingulate (AC) region and a guide cannula will be placed in the MSA of male Long-Evans rats. Once the rats have fully recovered from surgery, the investigators will monitor the electrophysiological behavior of the AC. Once theta rhythmicity is established and recorded, the investigators will induce a temporary lesion in the MSA while simultaneously recording AC theta to determine whether a lesion to the medial septal area abolishes the AC theta rhythm. Experimental results will be discussed at the conference.

Poster Presentation P48

**CLASSROOM CALCULATOR USE: HOW DOES IT ALL ADD UP?**

Eric Sala and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

This research focuses on how teachers utilize calculators in the classroom and how students perceive the role of the calculator in their learning. Four classes of secondary mathematics students were surveyed and students were assessed to gain insights on how calculators are useful in student learning. Teachers were interviewed to understand how they incorporate calculators into their teaching. Based on previous research, graphing calculators are more frequently used in upper-level courses than in lower-level courses. Students who rely extensively on calculators do not always use them to their fullest potential in solving problems. It is advocated that both students and teachers need to be proficient in using graphing calculators to maximize their benefits in learning and teaching mathematics.

Poster Presentation P49

**MATH, METHODS, AND MULTIPLE INTELLIGENCES**

Patricia Setchell and Leah Nillas\*

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Mathematics can be taught in a variety of ways, which corresponds to the reality that children learn in different ways. Howard Gardner identified eight specific intelligences (e.g., verbal/linguistic, logical/mathematical, musical, bodily/kinesthetic, visual/spatial, interpersonal, intrapersonal, and naturalistic) through which children learn. In this study, the teaching and learning of mathematics was analyzed according to Gardner's multiple intelligences through observations, interviews, and surveys. It was expected that children will utilize one or more forms of multiple intelligences (MI) in learning mathematics. Previous research showed evidence that children possess forms of MI. Results implied that teachers should address these intelligences in their teaching of mathematics

Poster Presentation P50

**OPTICALLY INDUCED MAGNUS EFFECT ON BIREFRINGENT PARTICLES**

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Focused light can exert significant forces upon polarizable microparticles. In addition, circularly polarized light can be theoretically shown to induce a torque upon birefringent particles. In the absence of other influences, then, birefringent particles placed under circularly polarized light should undergo angular acceleration, due to this optical torque. However, the presence of any surrounding medium will introduce a hydrodynamic drag, which should lead to an angular “terminal velocity.” In the microfluidic regime that we explore, the effects of drag overwhelm all inertial tendencies.

It can also be shown, theoretically, that a particle spinning within a fluid stream will experience a force perpendicular to the fluid flow, though no one has explored this “Magnus” or “Robbins” Effect in the microfluidic limit. Again, we must account for the fact that there is drag from the medium that opposes the spinning of the particle as well as drag from the medium that opposes the lateral displacement due to the “Magnus” Effect. We have shown theoretically that the forces associated with both the induced torque due to incident circularly polarized laser light as well as the lateral forces associated with the “Magnus” effect are significant enough to observe their effects. We have shown that since the lateral force associated with the “Magnus” effect varies with the cube of the particle size and the lateral velocity associated varies with the square of particle size, working in the microfluidic regime with micron sized particles greatly changes the expected outcome.

After presenting our calculation on the experimental accessibility of such effects, we will describe our experimental design, which uses focused circularly polarized light to both trap and spin micrometer-scale birefringent particles suspended in a uniform microfluidic flow. Our goal is to observe and measure any displacement in the direction normal to the imposed fluid flow; that is, to quantitatively measure the Magnus Effect at the micrometer scale.

The magnitude of achievable rotational rates has, for example, consequences for optical control of micromachines. In addition to the obvious applications to optically actuated micro-gears, pumps and motors, information gleaned from such basic studies may find application in a variety of micro-rheological (viscosity) studies and even in all-optical sorting technologies.

Poster Presentation P51

**QUANTIFICATION OF FLUOROQUINOLONE ANTIBIOTICS WITH  
HIGH PERFORMANCE LIQUID CHROMATOGRAPHY  
COUPLED UV/VIS DETECTION**

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Fluoroquinolones such as Ciprofloxacin, Cipro<sup>®</sup>, are a class of widely used antibiotics that inhibit DNA Gyrase of bacteria. These compounds are used in both human and veterinary medicines. Due to increasing number of antibiotic resistant bacterial strains, their presence in wastewaters and soil is important. The antibiotic, when administered, is not fully absorbed by the body; the excess is excreted. In the case of animals, the excess is excreted directly into the soil, while for humans the compounds enter the wastewater stream. If they are not removed in wastewater treatment, they may be released into the environment. The analytical method centered on reverse-phase high performance liquid chromatography on a C-18 column coupled with UV/Vis detection. The mobile phase was composed of acetonitrile and 25mM o-H<sub>3</sub>PO<sub>4</sub>. Fluoroquinolone compounds were visualized at 278nm. Solid phase extraction can be done using a mixed phase cation exchange cartridge and eluted with MeOH and o-H<sub>3</sub>PO<sub>4</sub>. These compounds are detected at such low levels, ng/L, that it becomes critical to avoid contamination; this study explores contamination possibilities.

Poster Presentation P52

**A VOICE UNHEARD: STUDYING THE SELECTIVELY MUTE**

Katrina Tammen and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

Children who suffer from selective mutism are capable of speaking and are sometimes quite talkative within the comfort of their homes. However, when placed in new or uncomfortable settings, they become anxious and will not speak. This research study investigated the different ways in which elementary teachers can make accommodations for selectively mute children in the classroom. Data was gathered through observations of a selectively mute kindergarten student and interviews were conducted with his teacher and his mother. Findings indicated that selectively mute students respond positively to comfortable atmospheres that foster the use of nonverbal communication.

Poster Presentation P53

**THE EFFECT OF MONOPSONY POWER IN MAJOR LEAGUE BASEBALL  
ON THE SALARIES OF PLAYERS WITH LESS THAN SIX YEARS  
IN THE MAJORS**

Andrew Tarman and Michael Seeborg\*  
Economics Department, Illinois Wesleyan University

This research attempts to measure the impact of monopsony power on baseball players with less than six years of experience. Past research indicates that players with less than six years of experience have lower salaries than players with the same productivity and more than six years of experience. To try and combat this monopsonistic behavior, baseball players formed the Players' Union and instituted an arbitration process. Through this process, a third party arbitrator listens to cases from both a player and owner and then chooses one salary bid. While this process is intended to help players gain market power, it is still unclear whether the actual process is effective. Therefore, it is important to measure the impact of this monopsonistic market to see if further changes in the arbitration process need to be made.

To do this, a case study of 19 outfielders who have filed for and received an arbitration hearing during the time frame of 1990-2003 are examined following their career throughout their pre-arbitration (first three years), arbitration year (after third year), and post-arbitration years (after fourth year on). By using the human capital model, three ratios of the players' actual salaries during these years to a predicted free agent salary is developed. The prediction that the ratios should increase throughout these three periods, due to the fact that the players gain more market power, is supported in the results. In fact, the ratios increase from 0.27 in pre-arbitration years, to 0.97 in the arbitration year, to over 1.2 in post-arbitration years. This indicates that the players face substantial monopsony power in the pre-arbitration year followed by a decrease in monopsony power through the arbitration process and post-arbitration years.

Poster Presentation P54

## **FEMALE GRAVITATION TOWARD PHYSICS**

Darcy Thompson and Leah Nillas\*

Educational Studies Department, Illinois Wesleyan University

This research investigates gender differences among high school students with regards to the study of physics. This study focuses on the different perceptions that males and females have about physics and differences in their classroom behavior. High school physics students were surveyed to find any gender differences in the perceptions about the subject. They were observed in a classroom setting to find if males and females behaved differently in a physics classroom. Based on previous research, females have more negative perceptions about physics than males, especially concerning the difficulty and usefulness of the subject. Male students are found to respond to questions more frequently and approach problems in a different manner than female students. As a result of this study, teachers are encouraged to adjust curriculum and teaching styles in order to encourage more female participation in physics classes and foster positive perception about the subject.



Poster Presentation P55

**HEARTLAND HEAD START PROGRAM EVALUATION**

Michelle Uhlenkott and James Sikora\*  
Sociology Department, Illinois Wesleyan University

Head Start is a federally funded preschool program for low-income families that nurtures the children academically, socially and nutritionally. In the past couple of years recent literature and the federal government have begun attacking Head Start arguing that the children in Head Start do not make enough progress in academic areas. The local chapter of this program is called Heartland Head Start, and is in charge of 13 preschool classrooms in the area. The federal government mandates that the children are tested three times per year on multiple indicators to view their progress. This data is then sent to the Heartland Head Start office where it is cataloged. In collaboration with Heartland Head Start, this study evaluated their program using the data they received from the Head Start classrooms in 2002-2003, 2003-2004, and the fall of 2004. The data was used to evaluate the academic progress of the children between the different years and within the 2003-2004 year. This study also determined the effect of the children's native language and the children's age on the children's progress in the 2003-2004 year. This study has found academic areas where the children excel and other areas that are still problematic for the children.

Poster Presentation P56

**WHAT ARE THEY SO ANGRY ABOUT?: A PHOTO EXHIBIT OF POLITICAL  
GRAFFITI IN GENEVA, SWITZERLAND**

Lavanga Wijekoon and Rebecca Gearhart\*  
International Studies Department, Illinois Wesleyan University

This poster presentation was inspired by the sheer profusion of political graffiti that covers the infrastructure of the city of Geneva. When I visited the city in the fall of 2003, these subversive prints were the only evident tell-tale signs of recent political demonstrations. While the protestors were gone, their messages - which I captured on film - remained. But what do these messages mean? What does it mean to Eat The Rich, to F\*\*\* Bush? What are they so angry about? These photographs give a glimpse into the vague, diverse, and, essentially subversive narratives of political graffiti.

Without their authors, the intended meaning behind the graffiti is hidden, which leaves room for the extrapolation of the political message that is conveyed. While the sentiments expressed can be crudely characterized as anti-capitalist and anti-American, this presentation seeks to reveal the individual interpretations and reactions of those who view the photos of the graffiti. Thus, the viewers of the exhibit will be encouraged to articulate their reactions to the political messages of the graffiti and write their own political messages on a board positioned next to the photo spread. This exercise is intended to stimulate thought and discussion on the issues and concerns that these political graffiti so forcefully convey.

Poster Presentation P57

**CHOREOGRAPHING *BOLD STROKE FOR A WIFE*:  
18TH CENTURY DANCE**

Alicia Carney and Sara Freeman\*  
School of Theatre Arts, Illinois Wesleyan University

This poster shows the research undertaken in preparation to choreograph the dances in the play *Bold Stroke for a Wife*. Sources include music recording and analysis information about period dance, and scholarship about 18th century staging practices.

Poster Presentation P59

**RESTORATION AND 18TH CENTURY THEATRE  
ARCHITECTURE AND DESIGN**

Taylor Entwistle and Sara Freeman\*  
School of Theatre Arts, Illinois Wesleyan University

Because the School of Theatre Art's production of *Bold Stroke for a Wife* aims to reference and recreate practices of 18th century theatre, the set design for the show was shaped by research into the theatre architecture and design practices of the period. This project shows the research and renderings of the resulting designs, illuminating the connections between historical practice and our production.

Poster Presentation P61

**FINDING THE HISTORICAL BASIS OF THE FOUR GUARDIANS IN  
*A BOLD STROKE FOR A WIFE***

Charles Haugland and Sara Freeman\*  
School of Theatre Arts, Illinois Wesleyan University

This panel displays research gathered in developing the campus production of Susanna Centlivre's early eighteenth-century comedy *A Bold Stroke for a Wife*. The presence of four heavily typed characters, Anne Lovely's guardians, necessitated research into their historical basis. Ultimately, the stockjobber was examined mainly in connection with accounts of the London coffeehouses that served as an early stock market. The Quaker compelled an investigation into both the canting practices of that faith and the larger context of dissenting religions. The history of archeology and the practices of antiquarians made light of the virtuoso. Finally, the character of the English fop called for an analysis of their system of codified gestures and trappings. This research was, in turn, applied practically by the actors and director in developing the production.

Poster Presentation P63

**WOMEN IN RESTORATION AND 18TH CENTURY THEATRE**

Briana North and Sara Freeman\*  
School of Theatre Arts, Illinois Wesleyan University

Women were first authorized to appear on the English stage after the 1660 restoration of Charles II to the throne. This period also brought the advent of the first professional female playwrights. Focusing on Susanna Centlivre, author of *Bold Stroke for a Wife*, and some of the major actresses of this period, this project profiles these pioneering women artists.

